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An experience sampling study of the momentary dynamics of moral, autonomous, competent, and related need satisfactions, moral enactments, and psychological thriving

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Abstract

Do people really have a psychological need to be moral? We present results from an experience sampling study of momentary moral need satisfaction, moral behaviors, and psychological thriving, which also provided an opportunity to test whether the moral need functions differently in people of high vs. low moral character. Results were that moral need satisfaction correlated with psychological thriving cross-sectionally and concurrently in everyday life as much as, and in some cases more than, the other psychological needs recognized as basic in self-determination theory. Further, of all the needs, moral need satisfaction was most tightly linked to moral behavior, demonstrating the specificity of content for the need. Based on these and previous results on the moral need, we present a theoretical analysis of morality as a basic psychological need against the criteria recently outlined by Ryan and Deci (in: Ryan, Deci (eds), Self-determination theory: Basic psychological needs in motivation, development, and wellness, Guilford Publishing, New York, 2017) and by which researchers measure the needs for autonomy, competence, and relatedness. In summary, the present research provides empirical evidence to add depth and breadth to the case for morality as an entrant to the list of basic psychological needs.

Keywords Morality · Basic psychological needs · Well-being · Self-determination theory

Do people really have a psychological need to be moral? Or are such attributes reserved for "do-gooders" or the highly self-deceived among us? Or perhaps they apply only to very specific circumstances and contexts. The current study examines the manifestation of the need to feel moral in daily life using experience sampling methodology (ESM). This study is important for the following reasons. First, it provides an opportunity to examine the empirical links among moral need satisfaction, moral behavior, and psychological thriving in people's daily lives. Previous research has so far indicated that, though people experience greater moral need satisfaction during very memorable life events (Prentice

et al. 2019), we do not yet know how the need might function moment to moment. This study also provides an important opportunity to test whether the moral need functions differently in people of high vs. low moral character. Finally, this study can reveal implications of the moral need, as well as the needs for autonomy competence and relatedness, for moral behavior and psychological thriving.

A second purpose is to present a novel theoretical analysis of morality as a basic psychological need against the criteria recently outlined by Ryan and Deci (2017). This is important because morality has so far passed only a preliminary empirical "entrance exam" for consideration among the class of current basic psychological needs for autonomy, competence, and relatedness (Prentice et al. 2019). The entrance exam was primarily to establish serious candidacy as a need, but passage of that step does not imply achievement of basic need credential. A more thorough theoretical analysis of its candidacy is in order. We provide this analysis in the context of the results of the current study.

Examining whether morality functions as a basic psychological need is a valuable endeavor that connects with numerous, longstanding psychological inklings that morality

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is such a need. For example, James (1878, p. 7) noted that "the joy of moral self-approbation…[may be] required to make the notion of mere existence tolerable." A century or so later, Steele's (1988) theory of self-affirmation echoed James' assertion, which holds that people are motivated to believe that they are good. Recent empirical research also provides suggestive evidence that there may be moral motives and traits (Lee and Ashton 2004; Read et al. 2010; Talevich et al. 2017; Zeinoun et al. 2018).

Despite this work that seems to triangulate upon the existence of a moral need, the notion has yet to receive much systematic investigation. What is required, in part, to better understand whether morality is a basic psychological need is to investigate whether it has the phenomenological, behavioral, and affective dynamics of a basic psychological need. Specifically, is it like the psychological needs of autonomy, competence, and relatedness (ACR) identified by Self-Determination Theory (SDT; Deci and Ryan 2000)? This core question provides fertile ground for a number of more specific questions about morality that this study addresses. Similar to ACR, we refer to a moral need as the experience that one is a moral (which may sometimes, or frequently, be at odds with the perceptions of others or "objective" accounts of morality). Stated differently, we define the need as the experience that one is moral, whatever that may be to the person and her or his moral standards. We note here that the point is not to operationalize any objective morality but rather to investigate the psychological function of the subjective experience of being moral.

Why might we suspect that such a need exists in the first place? At least four good reasons can be gleaned from work on the evolution of human collaboration, recent developments on the psychology of person perception, a logical analysis of human cognition and development, and our initial empirical work.

First, research from evolutionary approaches to human, and primate (proto-)morality more generally, often suggests that moral behavior has a long phylogenetic history and that it attends the uniquely advanced social coordination of which humans are capable (e.g., de Waal 2010; Tomasello 2009). If human capacities for moral behavior have been honed over long periods of evolutionary development (perhaps, in part, as elaborations on collaboration-linked capacities), then a correspondent phenomenology is likely, just as evolutionary accounts of the needs for ACR argue that the phenomenology arises out of universal capacities that are phylogenetically developed.

Second, recent research on person perception suggests that moral character is not only a fundamental dimension of personality judgments but may be the predominant dimension (Goodwin 2015; Goodwin et al. 2014). If it is the predominant dimension, then most of the social consequences of personality judgment accrue to moral character. People

can agree on moral character judgments, and such judgments are key to being liked, respected, and understood by others (Hartley et al. 2016; Helzer et al. 2014). Further, not only can being perceived as morally exceptional bring positive social consequences, it appears that it can also invite negative consequences in some circumstances, such as in cases of bullying the do-gooder (Pleasant and Barclay 2018). The previously highlighted dimensions of person perception, warmth and competence (Fiske et al. 2007), have clear analogues in basic psychological needs as relatedness and competence, respectively. Thus, if there exists a predominant moral dimension in person perception, then there should also be a psychological need correspondent to it.

Third, and somewhat related to above, morality might be our highest standard of evaluation for our own and others' behaviors. Whatever the highest standard of evaluation of people is, humans are likely to have a need to be judged favorably on that standard. If morality is the highest standard, then it stands to reason that there would be a need to be judged favorably on morality. However, in contrast to the evolutionary account, this point is based on ontogenetic processes by which we adopt standards. Once we have adopted moral standards as the highest levels of evaluation, then we would immediately need to recognize our own personal standing on that evaluation. Humans have the capacity to understand standards, and to develop the concept of should, or moral "oughts." Accordingly, a need to be moral may have developed. This may be at least partly why people indicate that their morality is the most essential part of their identities, selves, and souls, more so than other personality traits or their autobiographical memories (Strohminger and Nichols 2014).

Fourth, as we noted earlier, we conducted an initial empirical "entrance exam" on morality to determine whether it could be considered a strong candidate for a basic psychological need (Prentice et al. 2019). Specifically, we applied to morality a pioneering method from which Sheldon et al. (2001) provided evidence that ACR are basic psychological needs. In two studies and four samples participants recalled events in which they felt un/satisfied, meaningful, pleasurable, and at their best/worst (Prentice et al. 2019). They rated how much candidate psychological needs, including morality, were satisfied during them. Morality was frequently as or more satisfied than ACR during peak events. Further, it was positively related to indices of positive functioning, and it was one of the needs that followed most closely the satisfying/thwarting dynamic expected from the positive/negative events. These findings suggest that the experience of being moral may help people identify times when life is going well and that moral need satisfaction contributes to psychological thriving. Together, these results provide some suggestive evidence that morality may be a fundamental psychological need.

In sum, there are multiple reasons to believe that morality is a strong candidate for being considered a psychological need. However, systematic empirical investigation is nascent, and many questions remain. The present investigation can provide answers to a number of important questions that may advance inquiry into morality as a psychological need. For example, is moral need satisfaction actually related to psychological thriving in everyday life? Prentice et al. (2019) report that moral need satisfaction during extremely positive and negative life events is linked to thriving, but these results cannot speak to momentary, more mundane experiences and suffer from common drawbacks of retrospective self-report research. If it is linked to thriving at the momentary level, can it contribute to thriving above and beyond the psychological needs for autonomy, competence, and relatedness? If so, such results would provide converging evidence that morality meets one of the most essential criteria for basic psychological needs (Ryan and Deci 2017). Further, is it the case that moral satisfaction is actually linked to moral behavior? If not, the moral need would fail to specify the relevant content and thus fall short on a key criterion for recognition as a basic need (Ryan and Deci 2017).

An extreme groups approach

The current study also provides an opportunity to examine how moral behaviors, need satisfactions, and thriving unfold for people who report being generally high or low in their moral characteristics. There are two reasons for using this extreme group approach. First, morally-relevant situations and behaviors may occur more often during the lives of the highly moral. Thus, we will have more data and more power to test our hypotheses with this group. Second, given that moral standards are an important part of this need, people with especially high standards provide an interesting case. Extreme groups in combination with ESM provides the opportunity to take a centrifuge approach to the study of everyday morality, exploring how processes unfold as they are concentrated in the extreme groups (Fleeson et al. 2020).

For example, do people who self-report being highly moral in terms of their general character actually behave morally in everyday life? Alternatively, it may be the case that their moral behaviors do not align well with their self-reports of their moral character, which would be an important observation for the study of morality in itself. Further, how does moral behavior contribute to moral need satisfaction between the (extreme) groups? A number of plausible scenarios are imaginable at the high and low ends of moral character. For example, what happens when a highly moral person behaves immorally? One possibility is that some exceptions to their general tendencies is not enough of a sign in light of other consistent behavior to greatly impact

their need satisfaction; i.e., is there an accumulated consistency that overwhelms occasional missteps? Alternatively, their slights might be less severe, such that even though they report immoral behavior thanks to their high standards, the harm done is not actually enough to impact moral need satisfaction. Relatedly, if everyone reaps thriving from moral satisfaction and moral satisfaction from moral behavior, then this provides evidence for the universality of the need.

We also examine how moral behavior and moral need satisfaction impact psychological thriving differentially according to moral character. Perhaps it is the case that high psychological thriving among the morally exceptional is explained by their highly moral behavior or need satisfactions. It might also be that the morally exceptional are prepared to benefit from moral enactments due to their attention to morality or some related source of preparedness to benefit from cultivating further morality (cf. Sheldon et al. 2001). In contrast, the relatively morally-deprived state of the morally indifferent may leave them to benefit more psychologically from enactments of moral behavior when they manage them, analogous to a state of thirst. Such a pattern would indicate that even the people who might not express much care about *having* moral character still *need* and benefit from being and feeling moral, i.e., it would provide good evidence for the universal benefit of moral need satisfaction.

The present study

The present study therefore focuses on the following research questions: What is the relationship between momentary moral need satisfaction and thriving? What is the relationship between momentary moral need satisfaction and moral behavior? Are these dynamics related to self-reported high/low character?

As we have noted above, theory and research have so far highlighted the possibility that morality is a strong, if tentative, candidate for a basic psychological need. The current study provides the opportunity to extend this investigation. We report results from an empirical study of momentary experiences of moral need satisfaction and the ACR needs as well as of momentary enactments of morality. This study will allow us to go beyond the "entry exam" that morality previously passed and explore how it functions in the context of daily behavior via an experience sampling study. Specifically, it provides an opportunity to examine whether moral need satisfaction is linked to psychological thriving as people live their lives, providing a new orientation to the primary criterion for basic psychological needs (Ryan and Deci 2017). It also provides an opportunity to examine whether moral behavior can be directly tied to moral need satisfaction. Stated differently, the present study can reveal whether the moral need actually specifies moral content. Further, it

allows for the examination of the moral need functioning in the extremes of moral character, which in turn provides a basis for investigating the universality of the moral need. Finally, and more generally, this study affords the opportunity to examine the dynamic interplay between ACR, the moral need, psychological thriving, and manifestations of Big 5-linked and moral behaviors.

Method

Participants

Initial participants were 295 individuals sampled from a pool of 10,000 MTurk workers who had previously completed a self-report measure of moral character traits (as in Prentice et al. 2019; see also Helzer et al. 2014). Following the logic of extreme groups designs, participants were selected based on their belonging to one of three groups based on their global moral character scores: the morally indifferent (bottom 5% of moral character scorers), morally average (middle 5% of moral character scorers), and morally exceptional (top 5% of moral character scorers). Participants could receive up to $40 for participation. Survey materials and elements of this study that were preregistered can be found at https://osf.io/kujxc/. We eliminated participants from primary analyses when they provided fewer than 5 ESM reports, leaving an $N = 99$ for analysis ($N_{indifferent} = 26$; $N_{average} = 40$; $N_{exceptional} = 33$). These participants provided 3276 reports of moral need satisfaction, an average of 32 reports per participant. Notably, this average is more than the 28 minimum that was required for participants to earn the full reward offered for the ESM portion by performing 4 assessments per day for a week.

Sampling and analysis plan

Kreft and Leeuw (1998) recommended at least 30 people with 30 observations to be able to test cross-level interactions in ESM (e.g., here, predicting moral need satisfaction from moral group x moral behavior). We initially planned to recruit until we had 150 participants enrolled via consent. However, once we began collecting, we noticed about 50% of participants completed the presurvey without signing up for the more intensive ESM. Thus, we continued well past 150 consented participants until we had at least 150 who scheduled their ESM week via our online scheduling tool. At the outset, we assumed 30 reports from 150 participants during the study and inputting those values into a power estimator (https://aguinis.shinyapps.io/ml_power/; Mathieu et al. 2012) suggested we would have nearly 100% power for detecting cross-level interactions, assuming all other informed defaults for the simulation. Further,

multilevel power analysis based on our actual sample size and ICCs reflective of our actual data indicated power of 95.6% for detecting cross-level effects. Sensitivity analysis at $N = 99$ indicates that cross-sectional analyses are sensitive to Pearson's r of |.20|, assuming 80% power, alpha = .05 (two-tailed).

Given the high level of power for the multilevel analyses, two interpretive points are worth highlighting. One is that relative effect size comparison is much more informative than patterns of statistical significance. The other, and at the same time, non-significant results are more informative than they would otherwise be in studies with lower power.

The most focal analyses come from the multilevel models of the momentary variables. For all such models, we used restricted maximum likelihood, which allows for analysis in the presence of missing observations, or, here, some ESM reports. Further, unless otherwise noted, models include both variables that reflect the variable aggregated within persons as well as variables for momentary deviations from the person's average.

Procedure

After providing consent, the study was separated into three phases: pre-survey, experience sampling methodology (ESM), and post-survey. The pre- and post-surveys assessed a range of personality constructs relevant to need processes and psychological functioning, and each took about 30 min to complete. For the ESM portion of the study, participants reported on momentary need satisfactions and behavioral enactments up to 6 times/day for 7 consecutive days. Participants were asked to provide a schedule for their week of ESM and to provide their own reminders accordingly. They were asked to wait 2 h after waking to provide the first report, and then make a report every 2.5 h thereafter for up to 6 per day. They received the postsurvey within a few days of finishing the ESM. Participants were provided separate compensation for each phase of the study.

Materials

Pre- and post-surveys. Participants completed surveys of their personalities and motivations twice, at a few days before the beginning and a few days after the end of the ESM phase of the study.

Relatively chronic need satisfactions were measured with the Balanced Measure of Psychological Needs (BMPN; Sheldon and Hilpert 2012), which measures both the satisfaction and dissatisfaction of ACR. This measure was amended to include items about the satisfaction of the moral need taken from Prentice et al. (2019), and, to bring it further in line with the BMPN, three new items were generated to reflect dissatisfaction of the moral need, e.g., "I failed to

do what I knew was morally right." For all need variables, dissatisfaction items were reversed and averaged with the satisfaction items. This new scale for moral need satisfaction had good internal consistency, α = .82. Autonomy, competence, and relatedness had internal consistency values from α = .74 to .78.

Psychological functioning was assessed with the Comprehensive Inventory of Thriving (CIT; Su et al. 2014), which measures psychological thriving in 18 domains, e.g., meaning, self-worth, flow, belongingness, etc. All of the thriving indicators were averaged into a single variable to simplify analysis, α = .92.

Participants also completed a number of other measures during the pre- and post-surveys that are not of central focus to the present paper.

Experience sampling measures

For all of the momentary measures, participants were instructed to answer about their feelings and behaviors over the preceding 30 min.

State need satisfactions

The need satisfaction items from Prentice et al. (2019) included the original set of items for SDT's basic psychological needs from Sheldon et al. (2001), i.e., autonomy, competence, and relatedness, and added a set of items to assess moral need satisfaction within particular episodic memories. Thus we used these four, 3- to 4-item scales to assess momentary need satisfactions employed by Prentice et al. (2019). An example of a moral need satisfaction item was, "I felt a strong sense of moral fulfillment. Needs were rated on a 1 *strongly disagree* to 5 *strongly agree* scale. The moral need scale was reliable (averaged across all assessments: α = .89).

State enactments of morality

These were measured with the "concrete moral behaviors" from Meindl et al. (2015) experience sampling study of moral behavior, along with two new items: "I was actively contributing to the happiness and well-being of others," and "My behavior was in line with my own moral principles." Participants responded on a 1 *strongly disagree* to 7 *strongly agree* scale and were also provided the response option "Irrelevant/Did not apply." The scale showed acceptable reliability (averaged across all assessments: α = .73).

Psychological thriving

Many of the aspects of the CIT are already covered by basic psychological need satisfactions. However, participants were asked to respond to 5 thriving items from the short form of the CIT (i.e., the Brief Inventory of Thriving, or BIT; Su et al. 2014), such as "I was leading a purposeful and meaningful life." Thriving items were measured on a 1 *strongly disagree* to 7 *strongly agree* scale. These items formed a reliable measure (averaged across all assessments: α = .91).

Results

Need satisfaction and psychological thriving: presurvey measures

As an initial step, evidence that the moral need satisfies Ryan and Deci's (2017) primary criterion regarding psychological thriving was assessed via correlations between the measures of chronic needs and measures of thriving among the large set of participants who completed the pre-survey (N = 295). All four needs were strongly correlated with every single indicator of thriving ($r_{average}$ = .55). We next pursued a variance-competitive approach via regression. The overall thriving variable was regressed onto all four need satisfaction variables simultaneously. All four needs were significant, unique, positive predictors of thriving, $\beta_{autonomy}$ = .12, $\beta_{competence}$ = .35, $\beta_{relatedness}$ = .27, $\beta_{morality}$ = 17, ps < .017. The moral need was no stronger or weaker a predictor of thriving than the others according to confidence interval-mean overlap. These results indicate that morality meets the primary thriving criterion on par with ACR.

Analysis of experience sampling data

Variability in moral need satisfaction and behavior. Moral behavior and moral need satisfaction were both aggregated within person and their distributions are presented in the top panel of Fig. 1. As is clear in the figure, both aggregate variables exhibited large amounts of variability across the sample, indicating that some people were characteristically behaving and feeling more or less moral than others throughout the study. Further, both means were above the scale midpoints, indicating that, on average, people were reporting behaving and feeling moral more frequently than not. The disaggregated distributions are presented in the lower panels of Fig. 1, which suggest, along with the top panels, large amounts of variability both within- and between-persons.

Unconditional means models provided variance information for calculating ICCs to assess sources of variability directly. The moral need had greater variability between persons (74.3%) than within persons (25.7%). This indicates a high amount of consistency in people's experiences of moral satisfaction over time and by extension a relatively small amount of fluctuation, though there remains variability to be explained. Autonomy satisfaction showed
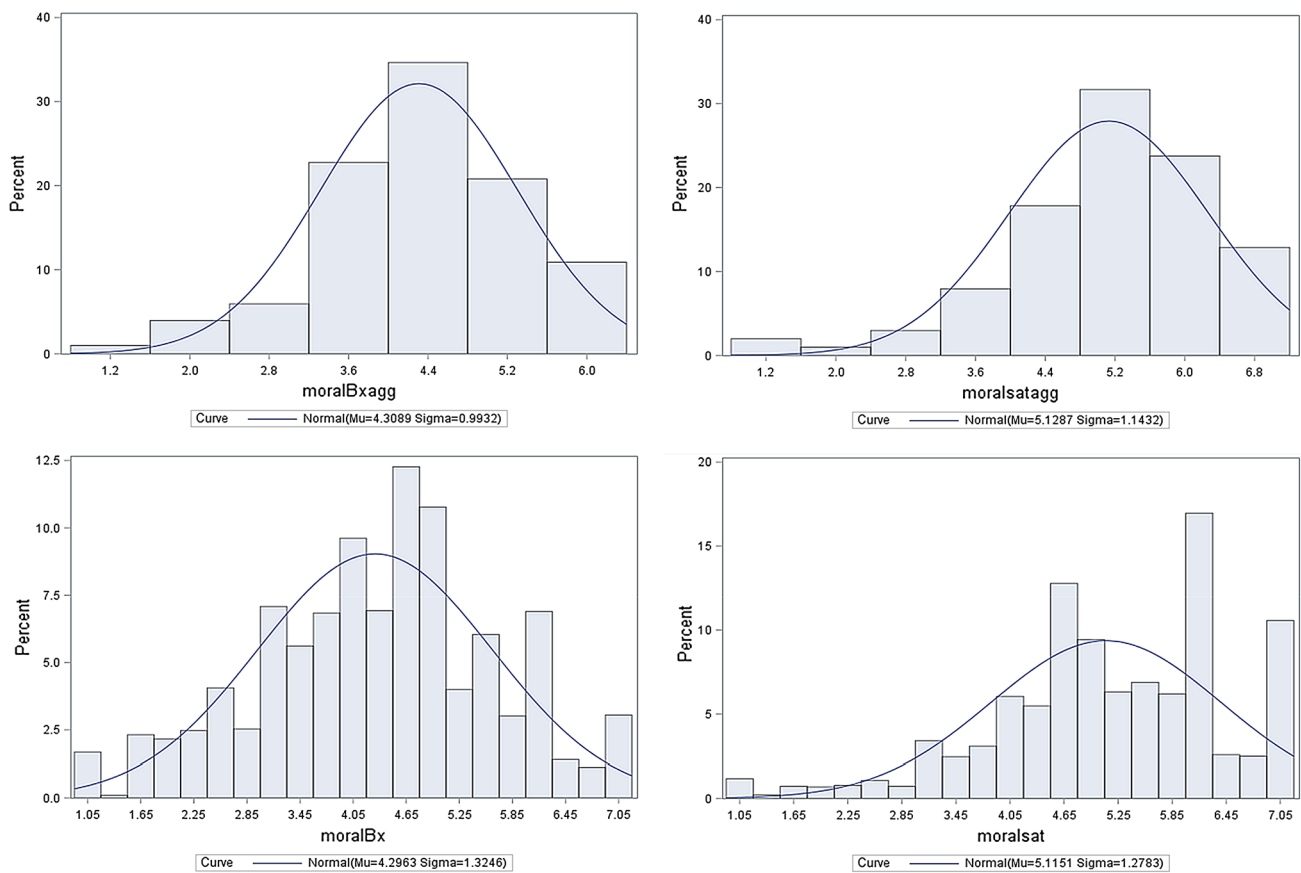
Fig. 1 Density distributions of moral behavior (left panels) and moral need satisfaction (right panels), aggregated within person (top panels) and all observations (bottom panels)

similar variability between-persons as morality (68.3%), while competence (59.4%) and relatedness (58.9%) were slightly less so. The variance of moral behavioral enactments was more evenly split between (56.9%) and within (43.1%) persons. This amount of within-person variability in moral behavior is quite similar to the 42% observed in previous research using a largely overlapping item set for moral behavior (Meindl et al. 2015).

Momentary dynamics of need satisfaction and psychological thriving. As an initial step, a model examined the prediction of momentary thriving from only aggregate and momentary moral need satisfaction, revealing a strong effect for moral need satisfaction, $b = .60$, SE $= .014$, $t(3203) = 42.95$, $p < .001$. Next, to examine whether moral satisfaction contributed uniquely to momentary psychological thriving, thriving was predicted by the four need satisfactions simultaneously. All four psychological needs were shown to be unique predictors in this analysis, indicating that each was positively linked to momentary thriving (see Table 1). Comparisons of the confidence intervals of the effects indicated that morality had a stronger effect

on thriving than all other needs, in contrast to the correlations observed in the presurvey data.

We noted that one item of the thriving inventory referred to being a good person. To eliminate this direct overlap between predictor and outcome, we dropped this item from the score and re-ran the analysis. Doing so did not lead to any substantive changes in the results or conclusions.

Momentary dynamics of moral need satisfaction and behavior. Moral behavior and moral need satisfaction were strongly correlated across all observations, $r = .60$, $p < .001$, a relation that was further borne out in a bivariate multilevel analysis predicting moral behavior from moral need satisfaction, allowing random intercepts for participants, $b = .43$, SE $= .02$, $t(3151) = 2.86$, $p < .001$, fixed effect $R^2 = .201$. That is, when participants reported doing more moral behavior they also tended to feel more morally satisfied. We also examined the unique predictive power of moral need satisfaction on moral behavior by testing all four needs simultaneously (including both momentary and aggregate variables). Moral need satisfaction remained a significant, unique predictor, despite the presence of significant effects

for competence satisfaction, and relatedness satisfaction, but not autonomy satisfaction, see Table 2. A model with only ACR had model fixed effect $R^2 = .24$, while the model including morality evinced a $\Delta R^2 = .14$. These results indicate that morality meets the specificity of content criterion (Ryan and Deci 2017).

As expected, participants in the morally exceptional group reported more moral behavior and moral need satisfaction than the average and indifferent groups (MBxLow = 3.76, SD = 1.35; MBxMed = 4.12, SD = 1.16; MBxHigh = 5.02, SD = 1.22; MNeedLow = 4.37, SD = 1.43; MNeedMed = 5.01, SD = 1.01; MNeedHigh = 5.95, SD = 1.00; Fs ≥ 15.00, ps < .001). Moving to a model in which moral need satisfaction was predicted by moral group, momentary moral behavior, their interaction, and controlling for aggregated moral behavior revealed that when participants reported behaving morally they also tended to report greater moral need satisfaction. This was qualified by an interaction, see Table 3. The slope of moral behavior was less extreme for the morally exceptional and average groups

Table 1 Results of mixed model predicting momentary thriving from momentary need satisfaction

	b	SE	t	p	Lower 95%	Upper 95%
Momentary						
Morality	0.28	0.02	15.66	<.001	0.25	0.32
Autonomy	0.14	0.01	10.73	<.001	0.11	0.16
Competence	0.16	0.01	15.58	<.001	0.14	0.18
Relatedness	0.15	0.01	17.48	<.001	0.13	0.17
Aggregated						
Morality	− 0.11	0.02	− 4.75	<.001	− 0.16	− 0.07
Autonomy	− 0.01	0.02	− 0.34	.732	− 0.05	0.03
Competence	0.03	0.02	2.04	.042	0.00	0.07
Relatedness	1.11	0.02	48.35	<.001	1.06	1.15

Df for effects of predictors = 3135

Table 2 Results of multilevel model predicting momentary moral behavior from momentary need satisfaction

	b	SE	t	p	Lower 95%	Upper 95%
Momentary						
Morality	0.21	0.03	6.58	<.001	0.15	0.28
Autonomy	− 0.04	0.03	− 1.47	.142	− 0.09	0.01
Competence	0.14	0.02	8.46	<.001	0.11	0.18
Relatedness	0.17	0.01	11.64	<.001	0.14	0.20
Aggregated						
Morality	0.44	0.16	2.69	.007	0.12	0.76
Autonomy	− 0.04	0.11	− 0.34	.734	− 0.25	0.18
Competence	0.11	0.09	1.27	.204	− 0.06	0.28
Relatedness	0.17	0.17	0.99	.322	− 0.16	0.49

Df for effects of predictors = 3135

Table 3 Results of multilevel model predicting moral need satisfaction from moral behavior, moral group, and their interaction

	b	SE	t	p	Lower 95%	Upper 95%
Intercept	2.75	0.42	6.48	<.001	1.91	3.59
Momentary moral behavior	0.19	0.02	9.21	<.001	0.15	0.23
Moral group 1	− 1.01	0.21	− 4.78	<.001	− 1.43	− 0.60
Moral group 2	− 0.45	0.18	− 2.53	.012	− 0.80	− 0.10
Moral behavior × moral group 1	0.07	0.04	2.01	.045	0.00	0.14
Moral behavior × moral group 2	0.09	0.03	3.19	0.001	0.04	0.15
Aggregate moral behavior	0.66	0.08	8.07	<.001	0.50	0.82

The morally exceptional group is the reference condition for effects of group. Moral group 1 = morally indifferent, 2 = morally average, 3 = morally exceptional. Df for effects of predictors = 3132
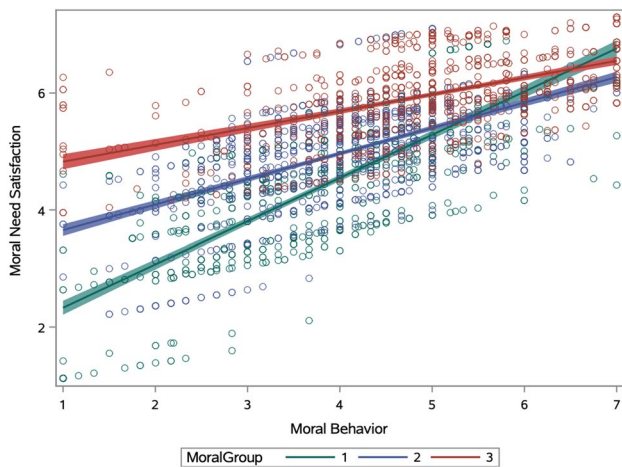
Fig. 2 Predicted values from the moral group×moral behavior interaction predicting momentary moral need satisfaction. Moral group 1=morally indifferent, 2=morally average, 3=morally exceptional

than for the indifferent group, see Fig. 2. Stated differently, the effect was such that behavior's effect on need satisfaction varied significantly between groups, though the slope of moral behavior was significant within every group. We approach potential explanations for this pattern in the discussion. This interaction maintained when the ACR needs were controlled, again underlining specificity 1.

The notion that moral behavior would lead to subsequent moral need satisfaction was tested via lagged analysis. In a bivariate model, moral behavior had a significant and positive effect on the subsequent report of moral need satisfaction, b=.037, SE=.014, $t(3040)$=2.55, p<.011. However, controlling for concurrent and aggregate moral satisfaction eliminated this effect.

General discussion

The purpose of the present piece was threefold. First, we extended the empirical study of morality as a psychological need via an ESM study of (a) psychological needs (including morality), (b) moral enactments, and (c) psychological thriving in everyday life. In the presurvey data, we found again that moral need satisfaction was a unique predictor of psychological thriving, replicating prior findings (Prentice et al. 2019). Morality was at least as potent a predictor of thriving as autonomy satisfaction. Second, at the level of momentary experiences, the morality need was more strongly tied to psychological thriving than competence and relatedness, and equally so as autonomy satisfaction. Results also indicated that the moral need is described by specific content—that is, moral behavior.

Second, empirical work on the morally exceptional/indifferent was extended in a number of ways by the current study. Participants who had previously reported having extremely high/low moral character reported correspondingly high/low values of moral behavior and moral need satisfaction in everyday life. This finding provides some validation of the selection procedure based on self-report, and more importantly paves the way for deeper study of motivational dynamics among these extreme groups. Perhaps most interestingly, their standing on these momentary enactments and need experiences had implications for their psychological thriving in interesting ways. Specifically, it was the morally indifferent in particular who appeared to make gains in moral need satisfaction upon enacting moral behaviors, which has implications for thriving. Similarly, the indifferent was that group who exhibited the strongest correlation between moral need satisfaction and thriving. Together, these findings suggest that morally indifferent people may be "thirstier" to satisfy their moral need (and perhaps all their needs due to the tendency of needs to operate in concert; Ryan and Deci 2017), whereas the highly moral may be less affected moment-to-moment due to longstanding satiation or buffering via other need satisfactions. It is also notable that when people are enacting morality at the highest levels, they are also experiencing the highest levels of psychological thriving, regardless of character standing. This underlines the universality of the need in that anyone can gain meaningful well-being benefits as they make progress on the need or goals that satisfy the need.

The finding that the indifferent benefited most from enacting moral behavior might seem to stand in contrast with previous findings that high need satisfaction sensitizes people to further experiences of need satisfaction (Moller et al. 2010). The dependent variable in Moller et al. (2010) was experienced value of need satisfying events *as indicated by positive affect*, which was predicted by a trait measure of general relatedness satisfaction and momentary relatedness (either induced experimentally or measured via experience sampling). The present study used momentary need satisfaction as the dependent variable, which was predicted by a trait measure of moral character and momentary moral *behavior*. Further research is needed in order to make an apples-to-apples comparison of the present results and those of Moller et al. (2010). Notably, Moller et al. (2010) measured relatedness satisfaction as a momentary outcome, which would have provided a useful manipulation check for their studies and allowed the presently desired comparison, but results with those variables are not reported. It is worth underlining that a report of enacting moral behavior is quite different from reporting that one feels related, as the latter is considerably more vague with regard to the cause(s) for that feeling.

The status of morality as a basic psychological need

We now discuss the current state of the evidence with regard to morality as a basic psychological need in the context of criteria for a basic need, as recently provided by Ryan and Deci (2017). We advance an argument for morality as a need according to these criteria. We couch it in the recognition that the systematic empirical investigation is still quite nascent. Still, we suggest that furthering the study of morality should maintain a primary focus in psychological research in the near future, perhaps especially because it can constitute a lively debate well worth having. Even if it does not meet criteria for a *basic* need by eventual consensus analysis, further research is warranted from researchers from motivational and personality traditions due to the important intra-/interpersonal implications of moral motivation so far uncovered (see, e.g., Fleeson et al. 2014; Goodwin 2015).

The SDT criteria and morality's standing as a need

Ryan and Deci (2017) recently provided six criteria that it is required of a candidate need to meet in order to join the basic set identified by Self-Determination Theory. We treat each criterion in turn and review whether morality has the potential to meet each one.

Psychological thriving

Primacy is given to the criterion against which the ACR needs have frequently been measured—that is "a new candidate need be strongly positively associated with psychological integrity, health, and well-being, *and* that its frustration be negatively associated with these outcomes, over and above the variance accounted for by the existing needs" Ryan and Deci (2017, p. 250). In Prentice et al. (2019), participants provided information on both their current satisfaction with life and psychological thriving (Diener et al. 1985, 2010), as well as retrospective reports of their positive and negative affect and quality of life during important life events. Moral need satisfaction aggregated across the life events was positively correlated with thriving ($rMTurk = .67$, $rstudents = .40$) and satisfaction with life (SWL; $rMTurk = .50$, $rstudents = .24$), as were the ACR needs and with comparable strengths. These findings for SWL and thriving were replicated in another study with two samples in Study 2. Turning to the question of unique variance prediction, a series of regressions predicting SWL and thriving from the needs revealed that morality and the ACR needs were all unique, positive predictors of both SWL and thriving. Reduced positive affect and quality of life was observed for events in which the satisfaction of the moral need was lacking. Finally, the moral need was shown to be one of the most responsive needs to the satisfying/thwarting dynamic across positive/negative life events. In sum, so far there is good evidence in favor of the positive connection between moral need satisfaction and psychological well-being and thus for a moral need to meet the primary criterion.

Specificity of content

Ryan and Deci's (2017, p. 251) second criterion states that a need "must specify content—that is the specific experiences and behaviors that will lead to well-being.[ACR] make clear what people need to do in order to be healthy— for example, do important activities well, endorse their actions, and connect with others." Like ACR we refer to a moral need as the *experience* that one is a moral, or the subjective sense that one is moral, whatever that may be to the person and her or his moral standards. The goal is not to attempt to operationalize any objective morality, but rather to investigate the psychological function of the moral need. Thus, the clear and specific content of the moral need are the specific instances of meeting personal moral standards, by performing morally good actions, that lead to experiences that one is morally good and produce well-being.

It remains an open question whether moral need satisfaction requires specific inputs in terms of the moral standards the person is striving for. That is, are there some moral standards that are more conducive to moral satisfaction (and, by extension, thriving) than others? So far, this question has played a background yet potentially obvious role in driving this research line forward. Applying the logic of SDT theory (and Aristotelian notions of flourishing), it seems quite plausible that the only moral standards that contribute to thriving are those that afford autonomous functioning. It seems unlikely that oppressive moral standards (e.g., for obeying authority for fear of punishment) contribute to satisfaction and thriving, or be internalized in the first place, even if a person follows them behaviorally. Research on these issues may in fact be the most interesting next steps for the study of morality as a psychological need. We suspect that meeting standards for compassion, fairness, and honesty will be the strongest contributors to moral need satisfaction and therefore thriving, and that loyalty, purity, and authority (cf. Graham et al. 2009) will be less conducive or not at all, and preliminary work in our lab is in line with that suspicion. Future research should examine whether moral need satisfaction is most frequently associated with specific moral behaviors (e.g. behaviors associated with fairness or beneficence; Weinstein and Ryan 2010) or moral foundations (Graham et al. 2009).

Explanatory utility

The third criterion is that "The postulate of a need must be essential to explain or interpret empirical phenomena" (Ryan and Deci 2017, p. 251). They further qualify explanation by gesturing toward evidence from mediational analysis as the means by which to provide evidence for explanatory capacity. Mediation is often merely window-dressing and unnecessary baggage that sits on top of statistical explanation. We argue that a basic psychological need to feel moral is essential to explain and interpret theoretically the uniquely human moral motivation and behavior. Currently, none of the other needs specify the content that a moral need does; that is, no other needs are specifically about meeting moral standards. Thus, the other needs cannot account for the human motivation to set and reach personal moral standards in the way that, say, relatedness can account for motivated behavior for social connection. Further, competence does not suffice, because it is about having effects on the world, which may in some cases be immoral. Although researchers can and do offer concatenations of SDT components to partially explain instances of im/moral behavior (e.g., Ntoumanis and Standage 2009; Sheldon et al. 2018), a moral need that is given its own separate standing may do so better and more parsimoniously than these other approaches.

Growth vs. deficit needs

Ryan and Deci (2017, p. 251) maintain, as they long have for basic psychological needs, that any new need should "be consistent with the idea of a growth need rather than a deficit need…there are two types of psychological needs that could be basic: growth needs that facilitate healthy development and are active on an ongoing bases and deficit needs that operate only when the organism has been threatened or thwarted." Further, they point out that biological needs are deficits in that they energize behavior primarily when the organism is failing their satisfaction. The evidence presented by Prentice et al. (2019) provides evidence for morality as a growth need in a few important ways. First, when people remembered peak experiences, morality was among the most satisfied needs during those episodes, indicating that moral satisfaction acted, in part, as a signal that life was going well during those times. Second, as already highlighted, morality was linked to indices of healthy development, thriving in particular in the present study. Other literature suggests that when people are prevented from making ongoing progress on life aspirations that are most likely to include other-regarding moral content (such as caring for one's community), they are prevented from developing well psychologically (Guillen-Royo and Kasser 2015). This suggests a moral need that is constantly operative and that when people are prevented from hitting their targets it leads to

suffering. Although there is some evidence for moral licensing effects, whereby reminding people of their morality leads to decreases in moral behavior, the moral licensing effect may be overestimated or altogether unreliable (Blanken et al. 2014, 2015). Thus, the lines of research offered by Guillen-Royo and Kasser (2015) and Prentice et al. (2019) provide suggestive evidence for morality as a growth need.

Categorical appropriateness

"Fifth, logically, a need must be in the appropriate category of variable" (Ryan and Deci 2017, p. 252). Here, they are warning researchers that candidate needs should not be the conflated with the outcomes to be predicted from the satisfaction of basic psychological needs. For example, psychological health falls into the category of variables that are increased or decreased by the satisfaction of needs, so indices of psychological health, such as vitality, self-esteem, or meaning, should not be considered needs but rather outcomes. The subjective experience that one is meeting moral standards may be somewhat akin to self-esteem at first glance, as self-esteem refers to meeting standards of social value. However, so far, we have measured the experience of being moral only with reference to one's own standards. Further, satisfying the moral need (outside of deception, to which all needs are vulnerable) requires conducting specific actions with specific motives and beliefs. Thus, those actions are the originators, and move morality outside of the outcome variable category. Moral need satisfaction may also be an outcome of environmental factors, just as autonomy satisfaction is an outcome of autonomy support. However, as reviewed above, moral need satisfaction has unique predictive power for explaining variance in psychological health outcomes like thriving. By this metric, moral need satisfaction currently appears to be situated more appropriately as such a predictor. Future research will have to take up the task of testing the kinds of hypotheses to which Ryan and Deci point under the fourth criterion, which will underline satisfaction of this fifth criterion (Jayawickreme et al. 2020).

Universality

The final consideration Ryan and Deci (p. 252) offer for a basic need "is that it operates universally—that is for all people in all ages in all cultures." Further, the need must be a reasonable fit to evolutionary considerations and convey advantages that would have driven its universality. We have approached this point to some degree in our earlier response to why such a basic psychological need should exist in the first place. The human capacities for collaboration and helping appear to come online at a very early age across the species (Tomasello and Vaish 2013), suggesting such capacities are evolutionarily honed and ready to come online

during critical developmental periods. Children as young as 3-years-old can keep promises and expect them to be kept by others, punish others for moral transgressions, and engage in restorative behavior for their own transgressions (Hepach et al. 2017a; Kanngiesser et al. 2017; Mammen et al. 2018). Further, moral behavior appears to be intrinsically motivated, as child transgressors exhibit distressed psychophysiology prior to enacting reparation, and they also exhibit posture indicative of positive mood when they successfully help others achieve their goals to a similar extent as to when they achieve their own goals (Hepach et al. 2017a, b). In our own work on the moral need in adults (Prentice et al. 2019), we have found that the satisfaction of the moral need does not appear to have differential impact on markers of well-being even when trait-level preferences for moral experiences are taken into account, which underlines the notion that everybody benefits from moral need satisfaction, even if they might differ in the extent to which they seek out such experiences (cf. Prentice et al. 2014).

In summary, the evidence so far suggests that the moral need appears to meet each of the six criteria for a basic psychological need, and evidence that would motivate serious consideration of disqualification has yet to arise.

A note on beneficence

With respect to beneficence (Martela and Ryan 2016a, b; Martela et al. 2018), some might suspect that beneficence and morality are the same thing. Though we are grateful for and inspired by the research efforts on beneficence, we disagree that morality should be considered solely that because we see beneficence as too narrow and is, rather than exhaustive, constitutive of our morality. Considering the Moral Foundations (Graham et al. 2009) again, beneficence largely relates to just one of them, Care/Harm, but morality is clearly more expansive than that. Further, Moral Foundations Theory itself may be incomplete (Iyer et al. 2012), so we do not mean to imply that MFT should be the only guide to examining contributors to moral need satisfaction. However, if morality is a psychological need, it is reasonable to assume that more than one foundation or standard (like prosocial impact; Martela et al. 2018) contributes to it.

Limitations and future directions

The present study has a number of strengths, particularly as they accrue to multimethod replication of our previous findings regarding the positive link between moral need satisfaction and psychological thriving. Despite this, future research should continue different ways of testing the moral need against key criteria. For example, although we have presented multiple lines of evidence that are indicative of morality's universality, a key test for future research is to

replicate the findings so far obtained in other cultural contexts, as these direct tests across cultures are a typical and compelling mode of assessing universality in SDT research (Chirkov et al. 2003; Ryan et al. 1999; Sheldon et al. 2004).

We must note that the current study is limited in terms of being able to make strong causal claims, particularly with the observance of the co-occurrence of moral need satisfaction and psychological thriving. We were unable to observe lagged effects that might support stronger causal inference. Nonetheless, future research should pursue other modes of predictive research to explore the causal dynamics involved in moral need satisfaction, well-being, and enactments of other traits, such as those of the Big Five. For example, future research can examine how enacting morality impacts moral need satisfaction and thriving in experimental settings, which can build on good, existing experimental evidence that helping/collaborative behavior has psychological benefits (e.g., Hepach et al. 2017b; Weinstein and Ryan 2010).

It will clearly be important to continue examining whether, to what extent, or under what cultural conditions the moral need is related to thriving. As one reviewer suggested, one might imagine that people living in places with thriving-suppressing normative standards are constrained in what moral standards they can successfully pursue and/or are constrained to pursue suboptimal ones, such as people living under authoritarian regimes. These constraints potentially limit the benefits that might otherwise accrue to thriving-promoting goals and values, as has been demonstrated for intrinsic values (e.g., Guillen-Royo and Kasser 2015). It is difficult to imagine, though, that being constrained to pursue thriving-suppressing standards would make those thriving-suppressing standards become thriving-promoting. While it seems an obvious reality that some people may face cultural orientations that encourage thriving-suppressing standards, that does not mean that people find thriving-suppressing standards easy to internalize or that those standards will end up contributing positively to well-being. The way situations, such as adversity (Rauthmann et al. 2014), impact the dynamics investigated in the present study is another empirical question that deserves high priority, as does investigating internalization of moral standards and how those internalizations and standards related to thriving.

Conclusion

At the outset, this piece asked: do people really have a psychological need to be moral? The present research provides theoretical analysis and empirical evidence to continue answering, however tentatively, in the affirmative. Feeling moral and acting morally are both tightly interwoven with

psychological thriving in everyday life as much as, and in many cases more than, other basic psychological needs.

Compliance with ethical standards

Conflict of interest All authors declare no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the American Psychological Association's ethical standards. The study was reviewed and approved by the Wake Forest IRB prior to data collection (IRB #IRB00023117). No study involved research on animals.

Informed consent Informed consent was obtained from all individual participants included in the study.

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