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Short Communication

Waiting with purpose: A reliable but small association between purpose in life and impulsivity

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ABSTRACT

Purpose in life contributes to health and wellbeing. We examine the link between purpose and behavioral impulsivity that may account for these benefits. In a community sample of 503 adults, we found a small yet reliable positive association between purpose and valuing future rewards on a delayed discounting task, a behavioral index of impulsivity. This bootstrapped correlation remained after accounting for Big-5 personality traits, positive affect, and demographic characteristics, suggesting a unique and robust link between purpose and impulsivity ($r = .1$). We interpret this connection as evidence that purpose enables a broader life view, which serves to inhibit impulsive distractions.

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1. Introduction

Purpose serves as an overarching framework that optimizes health and outcomes for those who have it. To have purpose in life is to be guided by “a self-organizing life aim that organizes and stimulates goals, manages behaviors, and provides a sense of meaning” (McKnight & Kashdan, 2009; p. 242). Purposeful individuals possess a dispositional and prospective sense that systematically guides their actions toward future achievements (Damon, Menon, & Bronk, 2003). By temporally orienting one's self toward a long view, purposeful individuals may limit the perceived value of proximal opportunities in order to take advantage those of greater rewards to come.

Impulsivity, on the other hand, generally refers to the lack of forethought or consideration of consequences associated with one's actions. While impulsive behaviors are not inherently wrong or malicious, they are often characterized as destabilizing and risky because they are undertaken with inadequate regard for one's circumstances (Eysenck & Eysenck, 1977) and can lead to undesirable outcomes. One common assessment of impulsivity involves asking individuals to choose between two rewards: an immediate and less valuable choice (\$100 today) or a future and more valuable choice (\$125 in one month). Individuals tend to prefer the immediate and less valuable reward — a

phenomenon referred to as *delay discounting* (Estle, Green, Myerson, & Holt, 2006; Myerson, Green, & Warusawitharana, 2001). Conceptually, impulsive individuals would lack the long view one observes in purposeful individuals. In the current study, we investigated the link between dispositional sense of purpose in life and behavioral impulsivity. Individuals that do not discount the value of delayed rewards are predicted to have a greater sense of purpose in life. Importantly, we accounted for well-known correlates of purpose (e.g., personality traits, and positive affect; Burrow & Hill, 2011; Scheier et al., 2006) as well as demographic characteristics (age, gender, education) in our analyses so to better identify the unique and independent link between purpose and impulsivity.

2. Methods and materials

2.1. Participants

Data were collected as part of the Human Connectome Project, an open access big data initiative dedicated to understanding brain function and behavior (Van Essen et al., 2013). The current sample was from the November 2014 data release (500 Subjects + MEG2; <http://www.humanconnectome.org>). Behavioral and demographic data were analyzed from 503 healthy adults (59% women; see Table 1 for demographic information). Eleven participants lacked data for years of education. Participants completed a comprehensive battery of assessment tools including the NIH Toolbox for Assessment of Neurological and Behavioral function (www.nihtoolbox.org) and auxiliary measures. The Toolbox includes measures of cognitive, emotional, motor and

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Table 1
Correlations and descriptives of all study measures.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|-----------------------------|-------|------------------------|------------------------|-------------------|-------|------------------------|------------------------|------------------------|------------------------|------------------------|-------------------|------------------------|
| 1 Purpose | – | .10[^] | .07 ⁺ | –.11 [^] | –.02 | .04 | .55[^] | .26[^] | –.03 | .37[^] | –.44 [^] | .44[^] |
| 2 Delay discounting (\$200) | | – | .60[^] | .06 | .03 | .17[^] | .03 | .10[^] | .07 | –.03 | –.05 | –.02 |
| 3 Delay discounting (\$40K) | | | – | .06 | .02 | .17[^] | –.01 | .10[^] | .04 | –.01 | –.05 | –.02 |
| 4 Gender | | | | – | .00 | –.04 | –.02 | –.15 [^] | .09 ⁺ | –.11 [^] | –.13 [^] | –.03 |
| 5 Age in years | | | | | – | .08 ⁺ | –.04 | .08 ⁺ | –.04 | .05 | –.02 | .04 |
| 6 Education in years | | | | | | – | .04 | .17[^] | .13[^] | .07 | –.04 | .07 |
| 7 Positive affect | | | | | | | – | .31[^] | .05 | .25[^] | –.46 [^] | .40[^] |
| 8 Agreeableness | | | | | | | | – | .16[^] | .21[^] | –.31 [^] | .34[^] |
| 9 Openness | | | | | | | | | – | –.08 ⁺ | .01 | .07 |
| 10 Conscientiousness | | | | | | | | | | – | –.42 [^] | .36[^] |
| 11 Neuroticism | | | | | | | | | | | – | –.39 [^] |
| 12 Extraversion | | | | | | | | | | | | – |
| Min | 30.90 | 0.02 | 0.02 | – | 22 | 11 | 21.90 | 14 | 12 | 12 | 0 | 11 |
| Max | 71.60 | 0.98 | 0.98 | – | 36 | 17 | 71.60 | 44 | 45 | 48 | 43 | 46 |
| Mean | 51.72 | 0.24 | 0.47 | – | 29.24 | 14.80 | 49.76 | 32.01 | 27.96 | 34.69 | 16.52 | 30.46 |
| SD | 8.95 | 0.19 | 0.29 | – | 3.46 | 1.90 | 7.84 | 4.84 | 6.09 | 5.70 | 7.16 | 6.16 |

Note: Bolded correlations are $p < .05$. The numbering of the columns corresponds to the variable names identified in the first column.

[^] Indicates that the 95% bootstrapped confidence interval does not include 0.

⁺ $p < .10$.

sensory processes in healthy individuals. Participants also completed measures of visual processing, personality and adaptive function, fluid intelligence, behavioral measures of emotion processing, and delay discounting.

2.2. Purpose

Purpose was assessed by self-report as part of the NIH Toolbox on Emotion, which includes both hedonic and eudaimonic components of psychological well-being, including the Meaning and Purpose survey. This 18-item questionnaire is composed of items taken from psychometrically validated assessments of purpose (<http://www.nihtoolbox.org/WhatAndWhy/Emotion/PsychologicalWell-Being>). For example, “My life has a clear sense of purpose” (1 = Strongly disagree; 2 = Disagree; 3 = Neither agree nor disagree; 4 = Agree; 5 = Strongly agree). Higher values indicate a greater sense of purpose.

2.3. Delay discounting

A measure of impulsivity, delay discounting estimates the undervaluing of rewards delayed in time. The current estimate of delayed discounting used a discounting task that identified indifference points where a person is equally likely to choose a smaller reward (\$100 today) sooner versus a larger reward later (\$200 in 3 years). Delays were fixed and reward amounts were adjusted on a trial-by-trial basis determined by the participants' choices in order to identify indifference points. This approach has been validated to provide reliable estimates of delay discounting (Estle et al., 2006). The area-under-the-curve discounting measure (AUC) provides a valid and reliable summary measure of how steeply an individual discounts delayed rewards (Myerson et al., 2001).

In this task, participants were presented with two choices on each trial – a smaller amount “today” or a larger amount at a later point in time. Participants made choices at each of 6 delays (1 month, 6 months, 1 year, 3 years, 5 years and 10 years) and for two delayed amounts (\$200 and \$40,000). For each combination of delay and amount of delayed reward (e.g., \$200 in 1 month or \$40,000 in 6 months), participants made 5 choices, and the value that would have been used for the immediate amount in a 6th choice is taken as the indifference point for that condition. The participants made all five choices for a particular combination of delay and amount before moving on to the next combination of delay and amount. The order of delayed amount was \$200 or \$40,000 today versus 6 months, 3 years, 1 month, 5 years, 10 years, and 1 year.

The first choice at each delay was between the delayed amount (\$200 or \$40,000) and an immediate amount equal to 1/2 the delayed

amount (e.g., \$100 today or \$200 in 1 month, \$20,000 today or \$40,000 in one month). The size of the adjustment after the first choice was always 1/2 the amount of the immediate value on the first choice (e.g., a change of \$50 if the first immediate amount is \$100). If the participant chose the immediate amount, then the immediate amount was reduced on the next choice (e.g., \$50 today versus \$200 in 1 month). If the participant chose the delayed amount, then the immediate amount was increased (e.g., \$150 today versus \$200 in 1 month). The amount of change on each subsequent choice is 1/2 the amount of the prior change (e.g., \$25 on the 3rd trial), regardless of whether the participant chose the immediate or the delayed amount. This procedure rapidly hones in on the amount of immediate gain that is close to the subjective value of the delayed gain. Area under the curve measure for each of the two amounts was computed (Myerson et al., 2001). Higher values for AUC are indicative of higher valuation for future gains (i.e. lower levels of impulsivity).

2.4. Covariates

Personality measures of agreeableness, openness, conscientiousness, neuroticism, and extroversion were assessed with the 60-item version of Five Factor Inventory (NEO-FFI). Positive Affect was estimated with the NIH Toolbox on Emotion (<http://www.nihtoolbox.org/WhatAndWhy/Emotion/PsychologicalWell-Being>). For each measure, higher scores indicate greater levels.

3. Results

Intercorrelations among purpose, delay discounting and the covariates (age, gender, education, positive affect, agreeableness, openness, conscientiousness, neuroticism, and extroversion), as well as the present sample's maximum, minimum, mean, and SD of these scores can be found in Table 1. Our central question was how purpose and delay discounting relate. We found a significant correlation between purpose and delay discounting of small rewards ($r(501) = .10, p < .05, 95\% \text{ CI: } .01-.18$) and a trend in the relationship with large rewards ($r(501) = .07, p = .055, \text{ single-tailed}, 95\% \text{ CI: } -.02-.16$). The reliability of all correlations (95% confidence intervals) was based on 5000 bootstrap resamples. Next, we further assessed this relationship by partialling out the variance associated with the covariates. Purpose was correlated with both delay discounting of small rewards ($r(481) = .13, p < .005, 95\% \text{ CI: } .03-.21$) and large rewards ($r(481) = .11, p < .05, 95\% \text{ CI: } .02-.20$).

4. Discussion

Despite growing evidence that a sense of purpose in life plays an important role in wellbeing, its implications for behavior have received little attention. The present study provides evidence that a greater sense of purpose in life is associated with lower impulsivity, demonstrated via a monetary delay discounting task. Consistent with our hypothesis, individuals who reported having a greater sense of purpose preferred larger future gains to smaller immediate ones. Importantly, these results persisted after accounting for dispositions in personality traits and positive affect, suggesting a robust and unique association between having purpose and future oriented behavior.

Our results are consistent with theoretical perspectives on purpose, suggesting it engenders a prospective outlook (Hicks, Trent, Davis, & King, 2012). To the extent that purpose tunes individuals' conscious attention toward experiences and goals they anticipate accomplishing, it may enable acting in the present in ways that secure future rewards. Indeed, there is evidence that even brief episodes of thinking about specific future events can significantly reduce the rate of delay discounting. Young adults prompted to provide a detailed description of what they would be doing on a day, several months in the future, were more likely to accept a monetary award on that distant day than a smaller amount immediately (Peters & Büchel, 2010). Thus, purposeful individuals may forfeit immediate gratification in favor of investing in their future, closer to when their ultimate aims will be actualized. Further to this end, purpose may limit engagement in known risk behaviors linked to impulsivity, such as cigarette smoking (Bickel, Odum, & Madden, 1999), and drug use and gambling (Reynolds, 2006) by making the downstream gains associated with avoiding them more salient. These examples reflect some of the decision points for which a sense of purpose may countermand impulsive behavior.

4.1. Conclusion

Overall, this paper provides initial empirical support for the link between purpose and behavioral impulsivity, and sets a course for further inquiry into factors that may drive this association. That purposeful individuals display a reluctance to grasp at immediate rewards at the expense of obtaining larger, future gains is consistent with accumulating evidence of the adaptive role of purpose, and

offers a glimpse into how it serves as a behavioral asset for those who cultivate it.

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