



Psychological flexibility and the Eudaimonic Activity Model: Testing associations among psychological flexibility, need satisfaction, and subjective well-being

Andrew J. Howell^{*}, Katelyn M. Demuynck

Department of Psychology, MacEwan University, Canada

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ABSTRACT

In accord with the Eudaimonic Activity Model, we examined whether need satisfaction and frustration mediate the association between psychological flexibility/inflexibility and subjective well-being. Undergraduate participants ($N = 281$) completed the Multidimensional Psychological Flexibility Inventory, the Basic Psychological Need Satisfaction and Frustration Scale, the Satisfaction with Life Scale, and the Scale of Positive and Negative Experience. Results showed that need satisfaction and frustration statistically mediated associations between psychological flexibility/inflexibility and facets of well-being. Similar effects emerged in analyses of a pre-existing data set. We discuss psychological flexibility in relation to both the Eudaimonic Activity Model and Self-Determination Theory.

Although known as a psychological treatment successfully applied to people experiencing such disorders as depression, anxiety, and chronic pain (Gloster et al., 2020), Acceptance and Commitment Therapy (ACT) focuses more on the enhancement and development of effective functioning than on the amelioration of specific conditions (Hayes, 2004; Hayes et al., 2012b). ACT seeks to increase clients' psychological flexibility by providing a different context for their experiences, altering the function of those experiences in the aim of valued living (Hayes et al., 2012b).

Given its relevance to psychological health, flexibility processes can be situated within a well-being framework. The Eudaimonic Activity Model (EAM; Martela & Sheldon, 2019) identifies three major sub-components of well-being. First, *eudaimonic activities and motives* comprise practices, goals, values, and motivations characteristic of healthy functioning. Second, *need satisfaction* emphasizes fulfillment of the needs for autonomy, competence, and relatedness as identified within Self-Determination Theory (SDT; Ryan, 1995; Ryan & Deci, 2000). Third, *subjective well-being* (SWB) includes life satisfaction, positive affect, and negative affect (Diener et al., 2017). The EAM framework also identifies a particular structure among these three well-being components: Eudaimonic activity satisfies psychological needs which, in turn, increases SWB.

Psychological flexibility is in keeping with the EAM category of

eudaimonic activity. As people go about their day-to-day lives, flexibility provides a context for experience (e.g., the ability to keep values prominently in mind) that may increase need satisfaction and, in turn, SWB. Conversely, inflexibility provides a context for experience (e.g., lack of values clarity) that may frustrate needs and lower SWB. Positioning psychological flexibility within the EAM framework can be seen as consistent with several goals of contextual behavioral science (CBS; Hayes et al., 2012a; Hayes et al., 2021; Levin et al., 2016b): predicting practical outcomes such as SWB, identifying antecedent variables that are manipulable, contextual, multi-dimensional, and potentially causal (i.e., psychological flexibility processes), and identifying dependent variables (i.e., need satisfaction and SWB) that affect the retention of healthy processes. This framework also aligns with pragmatic goals of ACT by examining mechanisms (i.e., need satisfaction) that mediate between adaptive psychological processes and well-being.

There are several justifications for conceiving psychological flexibility as a form of eudaimonic activity within an EAM framework: Psychological flexibility is considered a hallmark of psychological health (Feeney & Hayes, 2016; Kashdan & Rottenberg, 2010; Levin et al., 2016a), it includes elements (e.g., mindfulness, committed action) that overlap with those found in alternative conceptualizations of eudaimonic activity (see Martela & Sheldon, 2019), and it is a predictor or cause of both need satisfaction (Farid et al., 2020; Rolfs et al., 2018;

^{*} Corresponding author. Edmonton, Alberta, Canada, T5J 2P2.

E-mail address: howella@macewan.ca (A.J. Howell).

Schele et al., 2021) and SWB (e.g., Howell & Demuyne, 2021; Stenhoff et al., 2020). Moreover, Hayes (2020) recently argued that psychological difficulties reflect “mismanaged yearnings” (p. 52) reflective of psychological inflexibility, including the yearnings or needs for autonomy, competence, and relatedness. In line with our framework, Hayes further argued that psychological flexibility processes characterize more effective efforts to meet such needs and that successful need management yields well-being (see also Hayes et al., 2020).

The purpose of the current research was to test whether associations between psychological flexibility/inflexibility and the three facets of SWB were statistically mediated by need satisfaction/frustration. Regarding the prediction of life satisfaction, we expected significant mediation pathways involving high psychological flexibility » high need satisfaction » high life satisfaction, high psychological flexibility » low need frustration » high life satisfaction, high psychological inflexibility » low need satisfaction » low life satisfaction, and high psychological inflexibility » high need frustration » low life satisfaction. Similar predictions were made for positive affect; opposite predictions were made for negative affect. For the purpose of examining the replicability of the main study’s findings, we also tested these predictions using a separate, pre-existing data set.

1. Main study

1.1. Method

1.1.1. Participants

Three hundred and eleven participants were recruited from introductory psychology classes at a Canadian university. Twenty-eight were removed from the data set for failing two or more of three instructional attention-check items, and two more were removed for failing to complete at least 50% of study items. In the final sample ($N = 281$), participants’ mean age was 21.41 years old and 59.8% identified as female, 37.7% as male, and 2.1% as non-binary. English was a first language for 79% of participants. Regarding participants’ year of study, 68.3% were in their first year, 21.0% in second, and 10.7% in third year or beyond. Regarding program of study, 39.1% of participants were completing a Bachelor of Arts, 24.2% a Bachelor of Science, and the remainder were completing nursing, social work, commerce, or other degrees.

1.1.2. Measures

The 60-item Multidimensional Psychological Flexibility Inventory (MPFI; Rolffs et al., 2018) assesses experiences of psychological flexibility and inflexibility over the past two weeks. Items are rated on scales with endpoints (1) *never true* and (6) *always true*. According to Rolffs et al. MPFI composite scores are reliable (Cronbach’s α above 0.95) and show systematic relationships with convergent scales and criterion variables (e.g., vitality).

The Basic Psychological Need Satisfaction and Frustration Scale (Chen et al., 2015) consists of 24 items assessing satisfaction and frustration of needs for autonomy, competence, and relatedness. Items are rated on scales with endpoints (1) *not true at all* and (5) *completely true*. Evidence supports the psychometric properties of composite need satisfaction and frustration scores (e.g., their emergence in factor analysis, Kindt et al., 2016, and internal reliabilities of 0.89 and 0.88 in the current study, respectively).

The Satisfaction with Life Scale (Pavot & Diener, 2008) has five items rated on scales with endpoints (1) *strongly disagree* and (7) *strongly agree*. It exhibits good internal consistency ($\alpha > 0.80$) and discriminant validity (e.g., depression; Pavot & Diener, 2008). The 12 items of the Scale of Positive and Negative Experience (Diener et al., 2010) assess frequency of positive and negative emotions over the past four weeks, on scales with endpoints (1) *very rarely or never* and (5) *very often or always*. Positive and negative affect scores show good reliability ($\alpha > 0.80$) and strong convergence with similar measures (Diener et al., 2010).

1.1.3. Procedure

The study, approved by a human ethics committee and including informed consent, was conducted online. Items were presented in a randomized order.

1.1.4. Data analytic strategy

Mediation analyses employed version 3.5, module 4 of A. F. Hayes’ (2018) PROCESS macro imported into IBM SPSS Statistics, version 26. We conducted 10,000 bootstrap samples to yield 95% confidence intervals (CI’s). Our use of regression-based mediation analysis reflected that our hypotheses focused on each separate dependent variable and on the testing of indirect effects rather than overall model fit (A. F. Hayes, 2018). This approach also provides high sensitivity to detect mediated effects (power $> .80$ in our sample, according to Fritz & MacKinnon, 2007). PROCESS requires that no data be missing; therefore, $N = 236$, 236, and 235 for mediation analyses on life satisfaction, positive affect, and negative affect, respectively.

We tested whether need satisfaction and frustration (‘M’ variables) mediated associations between psychological flexibility and inflexibility (‘X’ variables) and each measure of SWB (‘Y’ variables). The product of the paths between X and M (denoted a) and M and Y (denoted b) yields the indirect effect (denoted ab). A statistically significant mediation effect is observed if the CI for ab does not include zero.

1.2. Results

Table 1 presents descriptive statistics for all scales. Table 2 and Fig. 1 report the mediation analysis on life satisfaction. For the complete model, $R^2 = 0.49$, $F(4, 231) = 54.87$, $p < .001$. The total effect of psychological flexibility on life satisfaction (c_1 path) was $B = 0.60$, $SE = 0.11$, $p < .001$ and, when controlling for the mediators, the direct effect of psychological flexibility on life satisfaction (c_1' path) was $B = 0.28$, $SE = 0.11$, $p < .05$. The two indirect effects were statistically significant. The total effect of psychological inflexibility on life satisfaction (c_2 path) was $B = -0.59$, $SE = 0.09$, $p < .001$ and, when controlling for the mediators, the direct effect of psychological inflexibility on life satisfaction (c_2' path) was $B = -0.12$, $SE = 0.11$, $p = .26$. The two indirect effects were statistically significant.

Table 2 and Fig. 2 report the mediation analysis on positive affect. For the complete model, $R^2 = 0.66$, $F(4, 231) = 111.34$, $p < .001$. The total effect of psychological flexibility on positive affect (c_1 path) was $B = 0.50$, $SE = 0.05$, $p < .001$ and, when controlling for the mediators, the direct effect of psychological flexibility on positive affect (c_1' path) was $B = 0.31$, $SE = 0.06$, $p < .001$. There was a significant indirect effect via need satisfaction but not need frustration. The total effect of psychological inflexibility on positive affect (c_2 path) was $B = -0.44$, $SE = 0.05$, $p < .001$ and, when controlling for the mediators, the direct effect of psychological inflexibility on positive affect (c_2' path) was $B = -0.26$, $SE = 0.06$, $p = .001$. There was a significant indirect effect on positive affect via need satisfaction but not need frustration.

Finally, Table 2 and Fig. 3 report the mediation analysis on negative affect. For the complete model, $R^2 = 0.68$, $F(4, 230) = 120.34$, $p < .001$. The total effect of psychological flexibility on negative affect (c_1 path) was $B = -0.16$, $SE = 0.06$, $p < .05$ and, when controlling for the mediators, the direct effect of psychological flexibility on negative affect (c_1' path) was $B = -0.16$, $SE = 0.09$, $p = .07$. The two indirect effects were not statistically significant. The total effect of psychological inflexibility on negative affect (c_2 path) was $B = 0.72$, $SE = 0.05$, $p < .001$ and, when controlling for the mediators, the direct effect of psychological inflexibility on negative affect (c_2' path) was $B = 0.60$, $SE = 0.06$, $p < .001$. The two indirect effects were not statistically significant.

2. Replication with a pre-existing data set

To examine the replicability of our results, we used a pre-existing data set from a non-overlapping sample of students (mean age =

Table 1
Descriptive Statistics and Inter-Correlations for Variables.

Variable	Correlations among variables								
	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1. Psychological Flexibility	3.63	0.72	(.946)						
2. Psychological Inflexibility	3.21	0.82	-.488	(.950)					
3. Need Satisfaction	3.64	0.66	.643	-.642	(.890)				
4. Need Frustration	2.63	0.78	-.486	.742	-.772	(.882)			
5. Life Satisfaction	4.34	1.29	.531	-.544	.657	-.633	(.840)		
6. Positive Affect	3.26	0.79	.653	-.669	.747	-.653	.677	(.916)	
7. Negative Affect	2.74	0.86	-.529	.799	-.635	.682	-.579	-.760	(.890)

Note. Values in parentheses are Cronbach's α coefficients. Correlations are based on sample sizes ranging from 247 to 274. All correlations are $p < .001$.

Table 2
Regression Table for Mediation Analyses of the Prediction of Life Satisfaction, Positive Affect, and Negative Affect by Psychological Flexibility and Inflexibility as Mediated by Need Satisfaction and Frustration.

Predictors and Mediators	Effect of predictor on mediator (<i>a</i>)	Unique effect of mediator (<i>b</i>)	Indirect effect (<i>ab</i>)	95% CI	
				lower	upper
Life Satisfaction (<i>Y</i> ₁)					
Psychological Flexibility (<i>X</i> ₁)					
Need Satisfaction (<i>M</i> ₁)	.40 (.05)**	.57 (.17)**	.23 (.07)	.10	.37
Need Frustration (<i>M</i> ₂)	−.21 (.05)**	−.45 (.14)**	.09 (.05)	.02	.20
Psychological Inflexibility (<i>X</i> ₂)					
Need Satisfaction (<i>M</i> ₁)	−.34 (.04)**	.57 (.17)**	−.19 (.06)	−.32	−.08
Need Frustration (<i>M</i> ₂)	.61 (.05)**	−.45 (.14)*	−.27 (.09)	−.45	−.09
Positive Affect (<i>Y</i> ₂)					
Psychological Flexibility (<i>X</i> ₁)					
Need Satisfaction (<i>M</i> ₁)	.39 (.05)**	.45 (.08)**	.18 (.04)	.10	.26
Need Frustration (<i>M</i> ₂)	−.20 (.05)**	−.03 (.07)	.01 (.02)	−.02	.05
Psychological Inflexibility (<i>X</i> ₂)					
Need Satisfaction (<i>M</i> ₁)	−.34 (.04)**	.45 (.08)**	−.15 (.04)	−.23	−.08
Need Frustration (<i>M</i> ₂)	.61 (.05)**	−.03 (.07)	−.02 (.05)	−.12	.09
Negative Affect (<i>Y</i> ₃)					
Psychological Flexibility (<i>X</i> ₁)					
Need Satisfaction (<i>M</i> ₁)	.40 (.05)**	−.16 (.09)	−.06 (.04)	−.14	.01
Need Frustration (<i>M</i> ₂)	−.21 (.05)**	.12 (.08)	−.02 (.02)	−.06	.01
Psychological Inflexibility (<i>X</i> ₂)					
Need Satisfaction (<i>M</i> ₁)	−.34 (.04)**	−.16 (.09)	.05 (.03)	−.01	.12
Need Frustration (<i>M</i> ₂)	.60 (.05)**	.12 (.08)	.07 (.05)	−.03	.17

Notes. Regression coefficients are unstandardized. Values in parentheses are standard errors.

* $p < .05$ ** $p < .001$.

22.01, 67% female) at the same university as in the main study (see Howell & Demuyne, 2021). All variables were measured as in the main study. Table 3 reports the mediation analyses on life satisfaction, positive affect, and negative affect, with *N*s = 292, 291, and 291, respectively.

For life satisfaction, $R^2 = 0.54$, $F(4, 287) = 85.55$, $p < .001$. The total effect of psychological flexibility on life satisfaction (c_1 path) was $B = 0.80$, $SE = 0.09$, $p < .001$ and, when controlling for the mediators, the direct effect of psychological flexibility on life satisfaction (c_1' path) was $B = 0.39$, $SE = 0.10$, $p < .001$. The two indirect effects were statistically significant. The total effect of psychological inflexibility on life satisfaction (c_2 path) was $B = -0.46$, $SE = 0.08$, $p < .001$ and, when controlling for the mediators, the direct effect of psychological inflexibility on life satisfaction (c_2' path) was $B = -0.04$, $SE = 0.09$, $p = .62$. The two indirect effects were statistically significant.

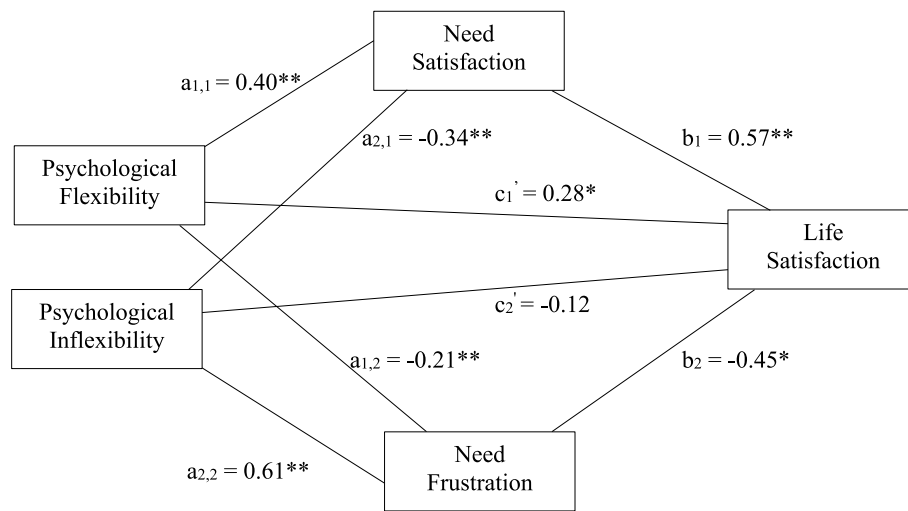
For positive affect, $R^2 = 0.61$, $F(4, 286) = 114.14$, $p < .001$. The total effect of psychological flexibility on positive affect (c_1 path) was $B = 0.48$, $SE = 0.05$, $p < .001$ and, when controlling for the mediators, the direct effect of psychological flexibility on positive affect (c_1' path) was $B = 0.26$, $SE = 0.06$, $p < .001$. There was a significant indirect effect via need satisfaction but not need frustration. The total effect of psychological inflexibility on positive affect (c_2 path) was $B = -0.42$, $SE = 0.04$, $p < .001$ and, when controlling for the mediators, the direct effect of

psychological inflexibility on positive affect (c_2' path) was $B = -0.27$, $SE = 0.05$, $p = .001$. There was a significant indirect effect via need satisfaction but not need frustration.

Finally, for negative affect, $R^2 = 0.62$, $F(4, 286) = 115.81$, $p < .001$. The total effect of psychological flexibility on negative affect (c_1 path) was $B = -0.25$, $SE = 0.05$, $p < .001$ and, when controlling for the mediators, the direct effect of psychological flexibility on negative affect (c_1' path) was $B = -0.13$, $SE = 0.06$, $p < .05$. There was a significant indirect effect via need frustration but not need satisfaction. The total effect of psychological inflexibility on negative affect (c_2 path) was $B = 0.71$, $SE = 0.05$, $p < .001$ and, when controlling for the mediators, the direct effect of psychological inflexibility on negative affect (c_2' path) was $B = 0.55$, $SE = 0.06$, $p < .001$. There was a significant indirect effect via need frustration but not need satisfaction.

3. Discussion

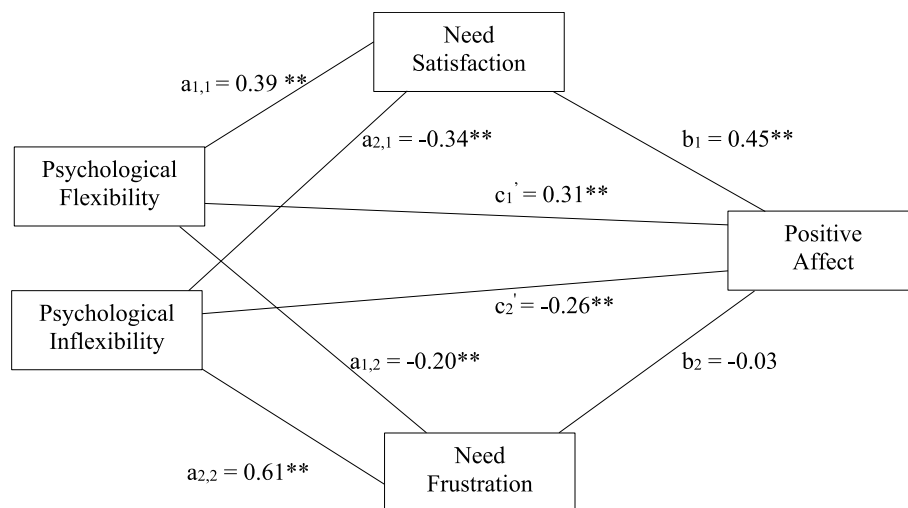
We yielded evidence consistent with the conceptualization of psychological flexibility as a model of eudaimonic activity within an EAM framework. In both data sets, need satisfaction and frustration each mediated associations between psychological flexibility and life satisfaction and between psychological inflexibility and life dissatisfaction. And in both samples, need satisfaction (but not frustration) mediated



Note. All four indirect (ab) pathways are significant (see Results). Path coefficients are unstandardized. $N = 236$.

* $p < .01$. ** $p < .001$.

Fig. 1. The prediction of life satisfaction by psychological flexibility and psychological inflexibility as mediated by need satisfaction and need frustration.



Note. The two indirect (ab) pathways through need satisfaction were significant (see Results).

Path coefficients are unstandardized. $N = 236$.

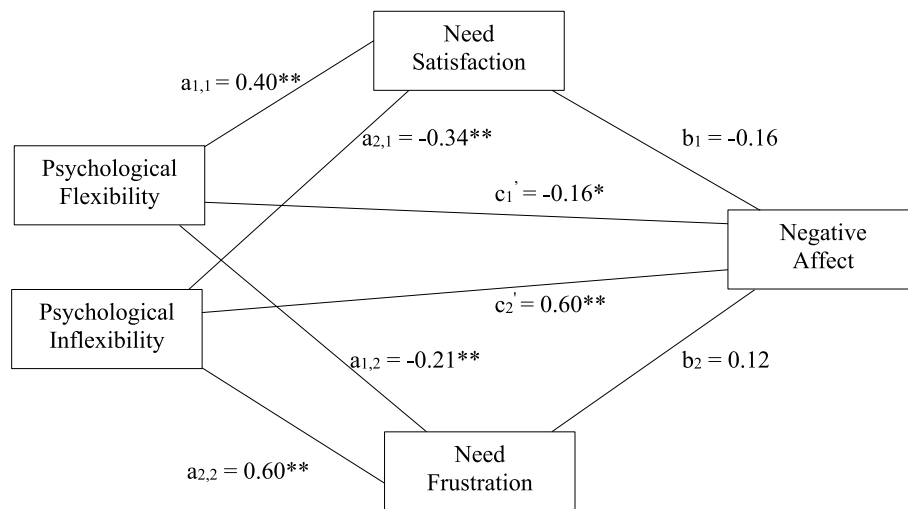
** $p < .001$.

Fig. 2. The prediction of positive affect by psychological flexibility and psychological inflexibility as mediated by need satisfaction and need frustration.

associations between both psychological flexibility and inflexibility and positive affect. Finally, need frustration (but not need satisfaction) mediated associations between both psychological flexibility and inflexibility and negative affect in the replication data set but not in the main study. Several of our findings are congruent with the notion that

need satisfaction and frustration are especially relevant to positive and negative emotional experiences, respectively (i.e., the 'dual-process model'; Bartholomew et al., 2011; Vansteenkiste & Ryan, 2013; Vansteenkiste et al., 2020).

There are limitations to our research. Our samples were composed of



Note. No indirect (*ab*) pathways were significant (see Results). Path coefficients are unstandardized. $N = 235$.

* $p < .05$, ** $p < .001$.

Fig. 3. The prediction of negative affect by psychological flexibility and psychological inflexibility as mediated by need satisfaction and need frustration.

Table 3

Regression Table for Mediation Analyses of the Prediction of Life Satisfaction, Positive Affect, and Negative Affect by Psychological Flexibility and Inflexibility as Mediated by Need Satisfaction and Frustration – Replication Data Set.

Predictors and Mediators	Effect of predictor on mediator (<i>a</i>)	Unique effect of mediator (<i>b</i>)	Indirect effect (<i>ab</i>)	95% CI	
				lower	upper
Life Satisfaction (<i>Y</i> ₁)					
Psychological Flexibility (<i>X</i> ₁)					
Need Satisfaction (<i>M</i> ₁)	.49 (.04)**	.65 (.15)**	.32 (.07)	.18	.46
Need Frustration (<i>M</i> ₂)	−.21 (.05)**	−.42 (.12)**	.09 (.03)	.03	.16
Psychological Inflexibility (<i>X</i> ₂)					
Need Satisfaction (<i>M</i> ₁)	−.25 (.03)**	.65 (.15)**	−.16 (.04)	−.25	−.09
Need Frustration (<i>M</i> ₂)	.60 (.04)**	−.42 (.12)**	−.25 (.06)	−.38	−.13
Positive Affect (<i>Y</i> ₂)					
Psychological Flexibility (<i>X</i> ₁)					
Need Satisfaction (M1)	.49 (.04)**	.41 (.08)**	.20 (.05)	.11	.30
Need Frustration (M2)	−.22 (.05)**	−.07 (.07)	.01 (.02)	−.02	.05
Psychological Inflexibility (<i>X</i> ₂)					
Need Satisfaction (M1)	−.24 (.04)**	.41 (.08)**	−.10 (.03)	−.16	−.05
Need Frustration (M2)	.59 (.05)**	−.07 (.07)	−.04 (.04)	−.13	.04
Negative Affect (<i>Y</i> ₃)					
Psychological Flexibility (<i>X</i> ₁)					
Need Satisfaction (<i>M</i> ₁)	.49 (.04)**	−.13 (.09)	−.06 (.06)	−.18	.04
Need Frustration (<i>M</i> ₂)	−.21 (.05)**	.23 (.07)*	−.05 (.02)	−.10	−.01
Psychological Inflexibility (<i>X</i> ₂)					
Need Satisfaction (<i>M</i> ₁)	−.24 (.04)**	−.13 (.09)	.03 (.03)	−.02	.09
Need Frustration (<i>M</i> ₂)	.60 (.04)**	.23 (.07)*	.14 (.05)	.03	.25

Notes. Regression coefficients are unstandardized. Values in parentheses are standard errors.

* $p < .05$, ** $p < .001$.

undergraduate students in the same setting and constructs were measured with a common set of operationalizations, limiting generalizability of findings. Our hypotheses concerned composite indices of psychological flexibility and inflexibility and of need satisfaction and frustration, limiting precision of our findings. We relied on self-report measures and examined relationships in a nomothetic manner.

Psychological inflexibility correlated substantially with negative affectivity, despite these constructs being conceptualized as separate. Finally, our data was cross-sectional, so that no causal conclusions can be drawn; moreover, there was overlap between the time frames for participants' ratings of flexibility/inflexibility and positive and negative affect.

Our research shares a focus with CBS on such values as the prediction

and influence of important human outcomes (e.g., well-being), the inclusion of motivational concepts (e.g., need satisfaction), and the consideration of different intellectual traditions (Hayes et al., 2021). Reflecting these commonalities, we provide two examples of how SDT identifies historical and situational contextual variables of potential relevance to the study of psychological flexibility. First, according to SDT, eudaimonic living is facilitated by the extent to which one's history of "social-contextual events" (Ryan & Deci, 2000, p. 70) is need-supportive; for example, a competence-supportive environment is one in which an individual's skill development and mastery are regularly scaffolded by others. From this perspective, a history of competence-support may allow a person, when facing a daunting task, to relate to self-deprecating thoughts as *just thoughts*. This, in turn, may facilitate commitment to the task at hand and an increased likelihood of need satisfaction and well-being. And, intervening to increase competence-support may leverage this process for a person otherwise lacking such an interpersonal context.

Second, SDT's prioritizing of intrinsic over extrinsic aspirations invites further consideration of the conceptualization of *valued living*. Intrinsic aspirations (e.g., for personal growth or community contribution) are closely related to need satisfaction, whereas extrinsic aspirations (e.g., for wealth or status) are not (Ryan & Deci, 2000). Therefore, the endorsement of intrinsic aspirations may promote a psychological context in which need satisfaction and well-being are facilitated; moreover, leading people who currently endorse extrinsic aspirations to consider the value of intrinsic aspirations may be a useful target within the psychological flexibility model. The mutual benefits of integration have been recognized recently by Ryan (2021), a founder of SDT, who identified that SDT and ACT share numerous psychological processes (e.g., autonomy, values, mindfulness) and theoretical assumptions (e.g., person-centered and process-oriented perspectives).

The integration of psychological flexibility with concepts from SDT has implications for research and practice. Regarding research, Hayes (2020) argued that psychological flexibility processes point to additional human needs for understanding/coherence, the experience of emotions, and orientation to time and place. Future work could study psychological flexibility's association with SWB as mediated by an expanded list of psychological needs. Research could also strive to examine psychological flexibility, need satisfaction, and SWB as they pertain to specific, situated actions. For example, the Personalized Psychological Flexibility Index (Kashdan et al., 2020) assesses how people manage distress in the context of pursuing self-identified goals of importance, allowing researchers to examine psychological flexibility in challenging contexts and its impact on situation-specific levels of need satisfaction and moment-to-moment SWB.

Regarding practice, greater incorporation of needs into ACT protocols would allow consideration of how clients' experiences are likely to affect psychological needs and whether need satisfaction mediates the impact of ACT on well-being outcomes. Finally, psychoeducation on the importance of basic human needs (Ryan & Deci, 2008), or striving to meet those needs through the therapeutic relationship (e.g., autonomy-support; Ryan, 2021; Ryan & Deci, 2008), provide additional means of incorporating SDT constructs into ACT.

Declaration of competing interest

The authors have declared no conflicts of interest.

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