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Parsing social motivation: development and validation of a self-report measure of social effort

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ABSTRACT

Background: Reduced efforts to form and maintain social bonds can exist in the context of a sufficient desire for social connection. Thus, social impairment common across many psychiatric conditions may often reflect failures in social effort exertion, despite normative levels of social liking and wanting. Although there are many questionnaires available that assess sociability, desire, or lack thereof for connection and perceived social support, there is no current self-report assessment of the behavioral outputs of social motivation.

Aims: We aimed to develop and validate a measure of the social effort in college students and the general population.

Methods: College students ($n = 981$) and a broader sample of adults via Amazon's Mechanical Turk (MTurk; $n = 506$) participated in the study.

Results: We identified two factors that represented content related to general social effort and social effort in adherence with social norms; we named the measure the Social Effort and Conscientiousness Scale (SEACS). Results suggest the SEACS is a reliable and valid measure of social effort.

Conclusions: Lower scores on the SEACS were associated with symptoms of depression and anxiety, highlighting the scale's potential utility in clinical populations. We include a discussion of possible applications of the SEACS, including its further use and application in psychopathology research.

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Introduction

Social motivation is a multifaceted construct that, like general motivation, can be conceptualized on different levels of analysis (Erdley et al., 1997; Rudolph & Bohn, 2014; Rudolph et al., 2005). Evidence from translational research suggests that general motivation is comprised of three key components that contribute to goal-directed behavior: (1) reward learning, (2) hedonic experience, and (3) effort computation and expenditure (Salamone & Correa, 2012). Social motivation can similarly be conceptualized, with social effort defined as the dispositional tendency to approach desired, or avoid undesired, social stimuli (Gable, 2006; Green, 1991; Messinger et al., 2011). Forming a new friendship, for example, requires both the general desire to be with others, as well as performing approach-related behaviors that facilitate ongoing interaction. Forming a new friendship may also arise out of a fear of loneliness. Thus, the social effort is one facet of social motivation that we believe reflects behavioral tendencies to either approach desired social outcomes or avoid undesired social outcomes, irrespective of preferences for or enjoyment of social connection.

Investigations of social motivation in psychopathology have focused primarily on extending approach/avoidance motivation theories (Carver et al., 2008; Gable, 2006).

Behavioral and neurobiological research suggests that people vary in sensitivity to general rewards (approach) and punishments (avoidance) (Kohls et al., 2013; Spreckelmeyer et al., 2009). Indeed, low levels of approach motivation and high levels of avoidance motivation are key symptoms of many mental health disorders, namely mood and anxiety disorders (Hofmann & Hay, 2018; Trew, 2011). Limited work has focused on social motivation in psychopathology, and even less so on social effort specifically, though the existing research suggests that people with psychopathology often report a desire for social connection on the one hand and heightened social avoidance behavior on the other (Fulford et al., 2018a). People with depression and psychosis, for example, tend to report reduced desire to “approach” smiling faces and more desire to “avoid” scowling faces compared to healthy controls. (Radke et al., 2015; Seidel et al., 2010).

Current findings provide limited insight into tendencies toward the social effort, or the behavioral outputs of social motivation, specifically. In a recent study of the impact of social context on willingness to expend effort for reward, people with schizophrenia showed an increase in effort in response to social encouragement, a response like that of controls (Fulford et al., 2018b). The broader construct

of social motivation is most often measured via self-reports of general sociability or desire for social connection (e.g., the Need to Belong Scale; Leary et al., 2013) or social avoidance (e.g., the Liebowitz Social Anxiety Scale; Liebowitz, 1987). However, there is no self-report instrument of social motivation assessing tendencies to exert effort in the service of forming and maintaining social bonds. Such a self-report would allow for examination of social effort as a construct separable from other components of social motivation, identifying unique contributions of social effort to social functioning that rely less on recent experiences in interpersonal relationships. This may be particularly relevant for understanding social impairment in psychopathology, including in people with anxiety disorders, schizophrenia-spectrum disorders, and major depression.

We aimed to develop and validate a scale of self-reported tendencies toward social effort exertion. While we intend the scale to ultimately be used to improve understanding of social impairment in psychopathology, we first aimed to develop and validate the scale in non-clinical samples exhibiting a broad range of social motivation. We used exploratory structural equation modeling (ESEM) to examine the factor structure of the scale. We also examined the reliability and validity of the scale. Finally, we tested measurement invariance with respect to gender and explored the factor structure and fit of the scale in a sample of participants drawn from Amazon's Mechanical Turk (MTurk).

Method

Scale development

We first piloted 30–40 items with undergraduate and graduate students using a deductive strategy like that recommended by Burisch (1984). Responses ranged from 1 (*strongly disagree*) to 6 (*strongly agree*)—no items were reverse scored. This initial item set was conceptualized by the authors as representing a broad range of behaviors related to social motivation and effort, spanning different potential opportunities to engage socially, and that did not necessarily rely on specific, pre-existing relationships. We intended for the items to capture social effort as a broad construct and thus we did not have a priori hypotheses about the number of potential factors that may emerge. Items were distinguished from other motivational constructs assessed by existing scales, such as anticipatory pleasure and reward responsiveness. We pilot-tested items within and outside our research groups to ensure conceptual clarity and content validity. Individuals provided feedback on any items that were difficult to understand. Conceptually overlapping or vague/difficult to interpret items were removed. A final set of 13 items were retained (Table 1), all reflecting tendencies toward exerting effort in the service of forming and maintaining interpersonal bonds, as opposed to desire for, or interest in, interpersonal connection¹. We added four

¹We initially included a set of items reflecting tendencies toward social avoidance as an additional check for discriminant validity. Because these items did not discriminate well from other related constructs (e.g.,

Table 1. Social Effort and Conscientiousness (SEACS) items.

1	*There is not enough time in the day to get everything done
2	^a I often arrange events with other people
3	*I make sure to eat breakfast every morning
4	^b I present myself in a way that makes a good impression on others
5	⁺ Thinking about how others will perceive me motivates me to work harder at things
6	^a When I have personal problems, I usually talk to friends or acquaintances about them
7	^a When someone texts or emails me to say hello, I usually respond as soon as I can
8	*It's important to me to exercise regularly
9	^a I make a lot of effort to connect with others
10	^b I compliment others when they have done something well
11	^a I regularly message people I know on social media (e.g., Facebook)
12	^a If I feel lonely, I find something to do with other people
13	^b I tend to ask other people how they are when I notice they're not feeling well
14	^a I like to share my emotions with others
15	*I feel out of energy most of the time
16	^a I am often the one to call friends and/or family when I haven't spoken to them in a while
17	^b I usually try to help other people when they are feeling down

*Filler items.

^aSocial effort items.

^bSocial conscientiousness items.

⁺Item removed due to low factor loadings.

filler items to distract participants from the main purpose of the scale (Schwarz, 1999); these items were not used in score calculation.

Participants

Data were collected as part of a larger study (Alvi et al., 2020). Two samples were drawn from undergraduate students in the northeast ($n = 428$) and southern ($n = 553$) United States, which we refer to as the combined college sample for the remainder of the paper. Informed consent was obtained from all participants before study onset and all procedures were approved by institutional IRBs. The third sample was collected from adults in the general population via Amazon's Mechanical Turk (MTurk; $n = 506$), a crowdsourcing platform often used in psychological research studies (Buhrmester et al., 2011). Samples drawn from MTurk are typically more sociodemographically diverse than undergraduate samples (Buhrmester et al., 2011; though see Keith et al., 2017). College sample participants were each compensated for course credit, while those from MTurk were each compensated \$3.00 USD. We included validity check items throughout the survey battery to omit data from participants who showed insufficient responses (Ran et al., 2015). Seven attention check items (e.g., "For this question, please select '4'") were included sporadically throughout the battery of questionnaires to identify participants who did not provide valid responses. Participants who answered more than four items incorrectly were removed from analyses (see [Supplementary materials](#) for more details). We also included a secondary college sample ($n = 676$) from the same southern United States University. This sample included

extraversion), and are well-captured in existing scales, we chose to omit them from the scale.

additional validity measures not included in the primary samples.

Procedure

Measures included in this study were administered through the online survey platform Qualtrics in a single session. Participants completed the surveys remotely. Items developed in this report were placed in the middle of the battery (see <https://osf.io/n3s4q> for the complete list of questionnaires for the Combined College and MTurk samples and <https://osf.io/6juyn> for the secondary college sample). All participants completed surveys in the same order.

Additional measures

We included self-reported measures to examine convergent, criterion, incremental, and discriminant validity of the social effort scale, as recently outlined in Clark and Watson (2019).

The revised social anhedonia Scale-Brief (RSAS; Eckblad et al., 1982)

The RSAS is a true-false scale designed to measure social withdrawal, a lack of interest in social relationships, and a lack of pleasure from social relationships. We used the 15-item short-form version of the scale (Winterstein et al., 2011) to examine the convergent validity of the social effort scale, as we predicted that social anhedonia and social effort should show moderate overlap conceptually. The RSAS shows good internal consistency, convergent validity, and discriminant validity, as well as evidence of measurement invariance (Li et al., 2021). Psychometric properties of the short-form mirror those observed in the full 40-item version (Winterstein et al., 2011). The RSAS demonstrated adequate internal consistency in the combined college sample ($\omega = 0.80$) and excellent internal consistency in the MTurk sample ($\omega = 0.87$).

Liebowitz social anxiety scale (LSAS; Liebowitz, 1987)

The LSAS is a measure of symptoms of social anxiety that presents participants with 24 social scenarios and asks participants to rate their avoidance and fear/anxiety of each situation on a 4-point scale. We utilized the total score combining both fear and avoidance, which had excellent internal consistency in the current study (combined college sample $\omega = 0.94$; MTurk sample $\omega = 0.87$). We chose to use the LSAS as a measure of convergent validity.

The big five inventory (BFI; John et al., 1991)

Given the potential overlap between items in our scale and basic personality traits, such as extraversion and agreeableness, we included the BFI as a measure of convergent validity (e.g., a person high in extraversion may be more likely to exert social effort compared to a person low in extraversion). Participants rate items on a 5-point scale containing

44 total items indicating the extent to which they agree with a given statement. Five subscales correspond to the five-factor model of personality: openness, conscientiousness, extraversion, agreeableness, and neuroticism. We examined the agreeableness (combined college sample $\omega = 0.78$; MTurk sample $\omega = 0.78$) and extraversion (combined college sample $\omega = 0.89$; MTurk sample $\omega = 0.84$) subscales; the conscientiousness subscale was also added from the secondary college sample ($\omega = 0.84$). These personality traits are associated with approach motivation more broadly (Carlo et al., 2005; Elliot & Thrash, 2002).

The inventory of depression and anxiety Symptoms-II (IDAS-II; Watson et al., 2012)

The IDAS-II is a 99-item questionnaire used to assess 18 factor analytically distinct clusters of symptoms related to anxiety, depression, and bipolar disorder. We used the 10-item dysphoria subscale as another measure of convergent validity, which is designed as a general measure of depressive symptoms and distress during the previous two weeks. The IDAS-II has good reliability and validity, and the dysphoria subscale is strongly associated with interview-based measures of symptoms of major depression ($r = 0.74$; Watson et al., 2012). The dysphoria subscale showed excellent internal consistency in both samples (combined college sample $\omega = 0.89$; MTurk $\omega = 0.87$).

Social provisions scale (SPS; Cutrona & Russell, 1987)

The SPS is a 24-item scale designed to assess six social provision categories (e.g., Attachment, Social integration). A total score is calculated by summing all items. The SPS has shown good convergent and discriminant validity, and good internal consistency, in prior studies (Mancini & Blieszner, 1992). The SPS was included in the secondary college sample and showed excellent internal consistency ($\omega = 0.89$). We conceptualized the SPS as a proxy for social functioning, and therefore was used as a measure of criterion validity, as we predicted that social functioning would be a higher-level, more distal outcome of social effort. We also used the SPS in our testing of incremental validity, as we predicted our self-report measure would be associated with the SPS total score above and beyond our measures of convergent validity (i.e., BFI extraversion and agreeableness and social anhedonia).

Emotion reactivity scale (ERS; Nock et al., 2008)

The ERS is a 21-item self-report measure designed to assess emotional reactivity. The scale is 21 items corresponding to three subscales, including sensitivity, arousal/intensity, and persistence. A total score is computed by summing all items. The ERS shows strong evidence of construct and criterion validity (Nock et al., 2008). Internal consistency was excellent for the ERS in the combined college sample ($\omega = 0.95$) and MTurk sample ($\omega = 0.97$). Prior research has demonstrated associations between ERS and anhedonia and depression (Hill et al., 2019) but not with social preferences or

behavior; as such, we hypothesized that our scale would be more strongly associated with social anhedonia than the ERS.

Data analysis

Distributions of all scales met assumptions of normality based on values of skewness and kurtosis. Demographic information was examined for all samples, including age, gender, race, and education level. Education level was categorized in years attended: Primary school (1–6); High school (7–12); College/University (13–16); Graduate school (17–22); Post-graduate (23+). We then compared the combined college and MTurk samples on gender and race using chi-square, and age and education level using independent samples *t*-tests.

Exploratory structural equation modeling (ESEM)

ESEM was used to examine the factor structure of the scale in the combined college sample. ESEM integrates aspects of both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) (Marsh et al., 2014). One use of ESEM is to permit the integration of these features of EFA and CFA to allow for both cross-loadings and correlated residuals (Asparouhov & Muthén, 2009). We followed this procedure, as we used EFA measurement models that allowed for cross-loadings while simultaneously allowing for correlated residuals.

Estimation method

ESEM procedures were conducted in Mplus using a Maximum Likelihood estimator and a correlated factors approach. All ESEM procedures were conducted on the combined university sample. Geomin rotation was used for all ESEM models given the exploratory nature of the

analyses. Goodness of fit for all models was measured by chi-square, root mean square error of approximation (RMSEA), comparative fit index (CFI), and Tucker-Lewis index (TLI).

Measurement invariance and internal consistency

Measurement invariance between males and females and internal consistency of the scale is in the supplemental materials.

Convergent, criterion, discriminant, and incremental validity

We conducted bivariate correlations between our scale and the RSAS, LSAS, BFI Agreeableness, Extraversion, and Conscientiousness (from the secondary college sample), IDAS-II, SPS, and the ERS to examine convergent, criterion, and discriminant validity. We then conducted hierarchical regression models predicting the SPS total score to test incremental validity (see Supplemental materials).

Results

The two college samples did not differ by gender ($p = 0.16$) but did differ by race categories and age ($ps < 0.001$). Students in the northeast university were younger and more likely of Asian descent than students in the southern university. The combined college sample differed from the MTurk sample in distributions of gender, race, and mean age and education level (all $ps < 0.01$). Full demographic information is reported in Table 2.

ESEM model building

We ran a parallel analysis in the combined college sample to identify a preferred number of factors that would

Table 2. Demographic information for all samples.

	Combined college sample ($N = 981$)	Mturk ($N = 506$)	Secondary college sample ($N = 673$)
Age (Mean (<i>SD</i>))* ^a	19.36 (1.68)	38.14 (12.62)	19.76 (2.04)
Education level (Mean (<i>SD</i>)) ^{b,c}	13.54 (1.54)	15.63 (2.94)	13.60 (1.30)
Gender (%) ^{*,d,e}			
Male	27.8	34.6	33.4
Female	72.0	62.5	66.6
Race (%) ^{*,d,f}			
White	66.8	80.2	74.4
Asian	20.6	7.1	16.2
African-American or Black	5.6	7.7	4.2
Native American or Alaska Native	0.3	1.0	0.6
Native Hawaiian or other Pacific Islander	0.1	0.0	0.1
Other race	6.0	4.0	4.5
Ethnicity (%) ^{*,g}			
Latinx	12.4	7.7	12.5

MTurk: Amazon Mechanical Turk.

* $p < 0.01$ comparing Combined college sample and MTurk sample.

^a $n = 980$.

^b $n = 970$.

^c $n = 504$.

^d $n = 501$.

^e $n = 665$.

^f $n = 667$.

^g $n = 975$.

adequately explain the data while not over-extracting factors. Two factors emerged from the parallel analysis: one including items covering general tendencies to exert social effort (Social Effort), and the other including items assessing tendencies to exert effort to adhere to social norms (Social Conscientiousness). We named the measure the Social Effort and Conscientiousness Scale (SEACS; Table 1).

We specified the first model as two factors including all SEACS items. The model did not fit the data well ($ML\chi^2 = 388.51$; CFI = 0.908; TLI = 0.864; RMSEA = 0.080). Item 5 (“Thinking about how others will perceive me motivates me to work harder at things”) did not load well onto either factor (Factor 1 = 0.062; Factor 2 = 0.227) and was removed. Omitting item 5 improved fit ($\Delta BIC = 2936.95$; $\Delta AIC = 2930.08$); however, overall model fit was less than adequate ($ML\chi^2 = 318.83$; CFI = 0.922; TLI = 0.880; RMSEA = 0.081). Modification indices suggested that allowing error variances between items 6 (“When I have personal problems, I usually talk to friends or acquaintances about them”) and 14 (“I like to share my emotions with others”) to covary would improve model fit. Because these two items loaded on the same factor and had similar wording and content, we allowed these error variances to covary; model fit was adequate ($ML\chi^2 = 101.84$; CFI = 0.983; TLI = 0.973; RMSEA = 0.038) and improved relative to the prior model ($\Delta BIC = 213.28$; $\Delta AIC = 214.99$). The two factors were moderately correlated ($r = 0.57$). As in the combined college sample, the parallel analysis indicated a two-factor solution in the MTurk sample.

A baseline 2-factor model containing all SEACS items did not fit the data well ($ML\chi^2 = 181.027$; CFI = 0.946; TLI = 0.920; RMSEA = 0.069). In contrast to the combined college sample, Item 4 did not load highly on either factor (0.27, 0.28). Like the combined college, item 5 also did not load highly on either factor (0.28, 0.07). Removing these items resulted in improved fit, but still less than adequate ($ML\chi^2 = 115.282$; CFI = 0.962; TLI = 0.939; RMSEA =

0.069; $\Delta BIC = 3105.18$; $\Delta AIC = 3096.76$). Modification indices suggested allowing the error variances of items 6 and 14 to covary. Resulting model fit improved ($ML\chi^2 = 82.252$; CFI = 0.977; TLI = 0.962; RMSEA = 0.054; $\Delta BIC = 29.98$; $\Delta AIC = 31.03$). Final factor loadings for each sample are in Table 3. Similar to the combined college sample, the two factors were moderately correlated ($r = 0.55$).

Convergent, criterion, discriminant, and incremental validity

Bivariate correlations between the SEACS and measures of social anhedonia (RSAS), psychopathology (LSAS and IDAS-II), personality (BFI agreeableness, extraversion, and conscientiousness), social functioning (SPS), and emotional reactivity (ERS) are in Table 4. Because SEACS total score was highly correlated with the Social Effort ($r = 0.96$, $p < 0.001$) and Social Conscientiousness ($r = 0.79$, $p < 0.001$) subscales, we presented validity results on the subscales only.

SEACS subscales were negatively correlated with measures of social anhedonia and psychopathology and positively correlated with BFI subscales from the combined college and MTurk samples, providing evidence of convergent validity. Furthermore, associations between SEACS subscales and the ERS were small in magnitude and significantly lower than associations between SEACS and measures of convergent validity. Analyses in the secondary college sample further indicated good convergent validity as indexed by moderate positive correlations between SEACS subscale scores and BFI conscientiousness. The secondary college sample demonstrated criterion validity as shown by significant associations between the SEACS and the SPS total score. See supplemental materials for Incremental validity results.

Table 3. ESEM solution in combined college and MTurk samples.

Items	Factor 1		Factor 2	
	Combined college sample	MTurk sample	Combined college sample	MTurk sample
Social effort				
6. When I have personal problems, I usually talk to friends or acquaintances about them	0.70	0.63	−0.00	0.12
14. I like to share my emotions with others	0.68	0.61	−0.03	0.06
12. If I feel lonely, I find something to do with other people	0.40	0.75	0.12	−0.01
9. I make a lot of effort to connect with others	0.52	0.80	0.25	0.02
16. I am often the one to call friends and/or family when I haven't spoken to them in a while	0.52	0.50	0.00	0.12
2. I often arrange events with other people	0.49	0.77	0.12	−0.13
11. I regularly message people I know on social media (e.g., Facebook)	0.49	0.66	−0.08	−0.02
7. When someone texts or emails me to say hello, I usually respond as soon as I can	0.40	0.15	0.12	0.42
Social conscientiousness				
17. I usually try to help other people when they are feeling down	−0.06	0.00	0.84	0.77
13. I tend to ask other people how they are when I notice they're not feeling well	0.00	0.07	0.78	0.77
10. I compliment others when they have done something well	0.04	−0.04	0.68	0.76
4. I present myself in a way that makes a good impression on others	0.03	0.28	0.45	0.07

ESEM: exploratory structural equation modeling; SEACS: Social Effort and Conscientiousness Scale; the ESEM model was an exploratory factor analysis with 2 SEACS factors. The values in bold are factor loadings.

Table 4. Convergent, criterion, and discriminant validity of the Social Effort and Conscientiousness Scale using Pearson *r* correlations.

	LSAS	IDAS-II Dysphoria	BFI- Extraversion	BFI- Agreeableness	BFI- Conscientiousness (<i>N</i> = 631)**	RSAS	SPS (<i>N</i> = 571)**	ERS
Combined college sample								
SEACS social effort	−0.45*	−0.33*	0.60*	0.39*	0.28*	−0.58*	0.47*	−0.21 ⁺
SEACS social conscientiousness	−0.18*	−0.18*	0.29*	0.35*	0.37*	−0.30*	0.61*	−0.06 ⁺
MTurk sample								
SEACS social effort	−0.61*	−0.47*	0.63*	0.51*	–	−0.71*	–	−0.33 ⁺
SEACS social conscientiousness	−0.24*	−0.25*	0.29*	0.48*	–	−0.42*	–	−0.13 ⁺

SEACS: Social Effort and Conscientiousness Scale; LSAS: Leibowitz Social Anxiety Scale; IDAS-II: The Inventory of Depression and Anxiety Symptoms; BFI: Big Five Inventory; RSAS: Revised Social Anhedonia Scale; SPS: Social Provisions Scale; ERS: Emotion Reactivity Scale.

**p* < 0.001.

**Sample from secondary analysis.

⁺Significantly different than convergent validity measures.

Discussion

We developed the Social Effort and Conscientiousness Scale (SEACS), a self-report measure of effortful behavior in the service of forming and maintaining social bonds. Exploratory structural equation modeling of responses from college students in two geographically distinct universities—as well as a sample drawn from the general public—revealed two latent factors. Results provide evidence of the reliability and validity of the scale across diverse samples.

Items loading onto the two factors identified in our analyses capture conceptually distinct qualities of social effort exertion. Items in the Social Effort subscale reflect tendencies toward effort exertion in the service of social connection for one's *own* purpose, such as a desire to connect with others for its own intrinsic value. Items in the Social Conscientiousness subscale reflect tendencies toward effort exertion in the service of adhering to social norms. Items assessing Social Effort may reflect tendencies for autonomous regulation of social goals, while Social Conscientiousness may reflect tendencies to engage in external social goals. Lower Social Effort may reflect a reduced drive to engage in close relationships. In contrast, lower Social Conscientiousness may reflect challenges engaging in more superficial, or less intimate, social exchanges. Future research should clarify the extent to which people with mental health challenges find superficial interactions *effortful* compared to interactions with known others.

There were minor differences in scale responses between the undergraduate and MTurk samples. Item 4 loaded onto the Social Conscientiousness factor in the college samples but did not load adequately onto either factor in the MTurk sample. Undergraduate students may place greater emphasis on how they are perceived by others. Indeed, college students may be more likely than older adults to conform to social norms by presenting themselves in a desirable way to peers (Rimal & Real, 2005). This difference could also be driven by depressive symptoms, as the combined college sample had significantly higher depressive symptoms as measured by the IDAS-II compared to the MTurk sample. Another difference between the two samples was that item 7 loaded onto the Social Effort factor in the undergraduate sample, but onto the Social Conscientiousness factor in the MTurk sample. As these loadings were low relative to other items, it may be that the item is not a key indicator of

either Social Effort or Social Conscientiousness. We recommend researchers take these differences into account depending on the sample they are testing.

We found evidence of incremental validity of the SEACS—both subscales explained unique variance in Social Provisions Scale (SPS) scores after controlling for agreeableness, extraversion, and social anhedonia. These findings indicate that the SEACS captures unique variance in social outcomes that is separable from extraversion, agreeableness, and social anhedonia. These results offer support for the use of SEACS subscales, as both explained incremental variance in the SPS Total score. One limitation is the relatively low amount of unique variance explained by the SEACS. However, low *R*² change values may still provide valuable information and potential clinical utility (Haynes & Lench, 2003). Research has shown that personality traits, such as extraversion, explain large amounts of unique variance in social functioning while accounting for other covariates (Ranjith et al., 2005). Thus, despite its low *R*² change values when predicting social functioning, the SEACS may still explain theoretically distinct variance in social functioning after accounting for key constructs including extraversion.

Although the SEACS has potential in aiding the assessment of social impairment in clinical populations, the heterogeneity in both the causal mechanisms and behavioral manifestations of such impairment across different disorders make it important to consider the relative contributions of the SEACS subscales to social impairment across disorders. People with schizophrenia, for example, report both high social anhedonia and loneliness (Gard et al., 2014; Shumway et al., 2003). Despite a reported desire for social connection, people with schizophrenia also show evidence of limited real-world social engagement, including a lower likelihood of setting and working towards social goals (Gard et al., 2014; Mote & Fulford, 2020). People with social anxiety disorder, on the other hand, often conform to social norms to present themselves as desirable to others and out of fear of rejection (Feng et al., 2018). Evidence of convergent validity in the current study suggests clinical populations may show deficits in the social effort. Specifically, experiences of depression and anxiety appear to covary with diminished social effort, which may contribute to social functioning deficits.

A limitation of the current study is that we may have not captured the full range of social effort and

conscientiousness, particularly in the combined college sample, as most participants likely had low levels of social impairment. Work is needed in clinical samples to demonstrate scale validity in the context of more significant social impairment. A second limitation is our use of a monomethod approach for scale validation. As self-reports can be vulnerable to biases, further validation using other methods would bolster evidence of scale validity. We recommend the use of a combination of behavioral tasks and other forms of data collection to further validate the scale in future studies. Another limitation was our lack of racial diversity within our samples. Because social norms can vary widely between cultural groups, understanding the validity and reliability of the SEACS in other geographic regions is warranted. Relatedly, certain items may not fully translate to clinical populations (e.g., schizophrenia), particularly items dealing with social media use and text messaging, as smartphone ownership is lower in clinical populations (Naslund et al., 2016).

We presented evidence of the reliability and validity of the SEACS; a scale designed to measure effort in the service of social connection. Incremental evidence suggests that the SEACS is a potentially valuable tool distinct from similar measures, such as social anhedonia and extraversion. Associations between depression and anxiety, and robust links with social support, suggest that implementation of the scale in clinical populations may offer insight into potential contributors to low social motivation. Ultimately, the SEACS may serve to inform targets of interventions designed to improve social outcomes, including social isolation and loneliness, in such populations.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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