

2-26-2024

An Examination of Psychological Flexibility as a Mediator Between Mental Health Concerns and Satisfaction With Life Among Autistic Adults

Ty B. Aller
Utah State University

Heather H. Kelley
Utah State University

Tyson S. Barrett
Highmark Health

Benjamin Covington
Utah State University

Michael E. Levin
Utah State University

Maryellen Brunson McClain
Follow this work in Digital Commons at: https://digitalcommons.usu.edu/psych_facpub

 Part of the [Educational Psychology Commons](#)

Recommended Citation

Aller, T.; Kelley, H.; Barrett, T.; Covington, B.; Levin, M.; McClain, M.; An Examination of Psychological Flexibility as a Mediator Between Mental Health Concerns and Satisfaction with Life Among Autistic Adults. *Autism in Adults*, 2024

This Article is brought to you for free and open access by the Psychology at DigitalCommons@USU. It has been accepted for inclusion in Psychology Faculty Publications by an authorized administrator of DigitalCommons@USU. For more information, please contact digitalcommons@usu.edu.

**An Examination of Psychological Flexibility as a Mediator Between
Mental Health Concerns and Satisfaction with Life Among Autistic Adults**

Ty B. Aller¹, Heather H. Kelley², Tyson S. Barrett³, Benjamin Covington¹, Michael E. Levin³, &
Maryellen Brunson McClain⁵

¹ Institute for Disability Research, Policy, and Practice; Utah State University

² Department of Human Development and Family Science; Utah State University

³ Highmark Health

⁴ Department of Psychology; Utah State University

⁵ Department of Counseling and Educational Psychology; Indiana University Bloomington

Ty B. Aller <https://orcid.org/0000-0001-8461-6061>

Heather H. Kelley <https://orcid.org/0000-0003-3778-3689>

Tyson S. Barrett <https://orcid.org/0000-0002-2137-1391>

Benjamin Covington <https://orcid.org/0000-0003-4731-814X>

Michael E. Levin

Maryellen Brunson McClain <https://orcid.org/0000-0002-6855-6246>

This manuscript was supported in part by a grant funded via the National Research Consortium on the Mental Health Aspects of Individuals with Intellectual and Developmental Disabilities.

We have no conflicts of interest to report.

Correspondence concerning this manuscript should be addressed to Dr. Ty B. Aller at 6800 Old Main Hill, Logan, UT 84321. Email: Ty.Aller@usu.edu.

Abstract

Background: Experiencing mental health concerns (e.g., depression, anxiety, stress) can have negative effects on satisfaction with life (SWL) for autistic adults. Current mental health supports that may promote SWL do not effectively meet the needs of autistic adults, often due to deficits-based approaches. **Methods:** To begin addressing the gap in research surrounding mental health supports among autistic adults, we designed a preregistered longitudinal study that used structural equation modeling to assess 289 autistic adults from the Simons Powering Autism Research (SPARK) program to determine if progress toward one's values, a strengths-based component of psychological flexibility, is a potential mechanism through which mental health concerns (i.e., depression, anxiety, and stress) impact SWL. **Results:** Results suggested that depression (but not anxiety or stress) negatively affected participants' SWL. However, when including components of psychological flexibility as a mediator, there was no longer a significant direct effect between depression and SWL, suggesting that influences on SWL were explained through participants' levels of components of psychological flexibility. The influence of values progress on the association between depression and SWL was significantly stronger than that of value obstruction (a deficit-based construct). Associations did not differ across gender. **Conclusion:** These findings provide preliminary support for interventions targeting improvements in psychological flexibility as they may help address core issues of deficit-based mental health services while also being able to emphasize outcomes that matter most to the autism community.

Keywords: Autistic Adults, Mental Health Concerns, Psychological Flexibility, Satisfaction with Life

An Examination of Psychological Flexibility as a Mediator Between Mental Health Concerns and Satisfaction with Life Among Autistic Adults

It is estimated that approximately 5.5 million adults in the United States, over 2% of the population, have autism spectrum disorder (ASD).¹ Autistic adults¹ (i.e., adults diagnosed with ASD) commonly experience mental health concerns (MHC; e.g., depression, anxiety, etc.) that can negatively affect their satisfaction with life (SWL).²⁻⁴ Despite this, there are numerous systemic barriers to effective treatment for MHC for autistic adults⁵ and many of the available therapeutic approaches (e.g., cognitive behavioral therapy) available to autistic adults do not fully meet their self-identified needs.⁶⁻⁸

These issues are likely due to mental health services often being transposed onto autistic adults from non-autistic adults with the underlying assumption being that they will be equally effective for both groups. However, this warrant is unsubstantiated, and research inquiry is needed to determine if mechanisms of action from current therapy models work similarly for autistic adults. Accordingly, we sought to determine if components of psychological in/flexibility (i.e., values obstruction and values progress) might explain the association between MHC and SWL among autistic adults. We are interested in psychological in/flexibility given that it is a construct that research suggests can be improved across diverse populations,⁹ including individuals with developmental disabilities,¹⁰⁻¹¹ using interventions that are easily scalable and cost-effective (e.g., online, self-guided interventions).¹² The following sections summarize relevant literature regarding MHC among autistic adults, how these concerns may impact community living and engagement, and how psychological in/flexibility may be a valuable skill

¹ There is an ongoing discussion regarding whether to use identity-first (i.e., autistic adults) or person first (i.e., adults with ASD) language in scholarly writing. As the both the self-advocate co-author on this manuscript and a majority of autism stakeholders in the United States report a preference for identity-first language (Taboas et al., 2022), we use autistic adults (AA) throughout this manuscript.

to target in interventions that aim to improve SWL for autistic adults who are also experiencing MHC.

Literature Review

Mental Health Concerns (MHC) and Quality of Life Among Autistic Adults

Autistic adults are more likely to experience a variety of MHC than non-autistic adults, which often negatively affect their satisfaction with life.³ A meta-analysis of 30 studies found the average lifetime prevalence rate of anxiety among autistic adults to be 43% and the current rate to be 27%.¹³ Regarding depression, a meta-analysis of 29 studies on prevalence rates of depression among autistic adults identified a 23% rate of current depression and a 37% lifetime rate of depression.¹³ In addition to the high prevalence of MHC among autistic adults, autistic adults explain that they may experience MHC differently than their non-autistic peers,⁸ suggesting that using the DSM-5 to guide treatment for autistic adults may be unhelpful due to its focus on symptom reduction, viewing autism as a deficit, and not focusing on quality of life improvements.¹⁴ For example, a qualitative study of 8 autistic adults found that nearly all participants reported their depression or low mood as a “very physical experience” that was often expressed as an “inability to control their own physiological reactions.”¹⁵ Regarding anxiety, a systematic review of 11 studies on trait anxiety in autistic adults and non-autistic adults found that 10 of the 11 studies reported that autistic adults had significantly higher levels of trait anxiety.¹⁶ Qualitative research on anxiety among autistic adults also found that autistic adults presented anxiety in several non-DSM-5 diagnostic ASD-specific ways (i.e., socio-communicative expressions, restrictive and repetitive behavioral-related sources of anxiety, anxiety related to executive functioning, and somatic expressions).¹⁷

There are also differences in MHC among autistic adults depending on gender. For example, studies have reported that autistic women are more likely than autistic men to report a MHC or be hospitalized for any psychiatric related condition.¹⁸ Among gender non-conforming autistic adults, there lacks a clear and consistent understanding of how gender identity might influence MHC, but there is a consistent call for further investigation as there are increased rates of MHC among gender non-conforming autistic adults.¹⁹

Despite differences in how AA experience MHC, the consequences of MHC for autistic adults' SWL are similar to their non-autistic counterparts,²⁰ but may occur at an increased rate.²¹⁻²² For instance, autistic adults experiencing MHC also commonly experience suicide risk at an increased frequency, particularly among autistic women, when compared to their non-autistic counterparts.^{23,2} Relatedly, MHC among autistic adults may be compounded by societal barriers and stigmas that result in autistic adults being less likely to pursue higher education and maintain meaningful employment.²⁴⁻²⁶ Despite the impact of MHC on autistic adults' SWL, little research has investigated how naturally occurring strengths of autistic adults can help promote SWL even while experiencing MHC.²⁷⁻²⁸

Psychological Flexibility and SWL Among Autistic Adults Experiencing MHCs

Given the barriers to effective and acceptable treatment for MHC for autistic adults, there have been recent efforts from stakeholders within the autism community to explore strengths-based approaches that can positively contribute to autistic adults' SWL while experiencing MHC. Psychological flexibility, the theorized mechanism of change in acceptance and commitment therapy (ACT),²⁹⁻³⁰ is a construct with the potential to meaningfully address this call for more strengths-based research and interventions. Psychological flexibility is the ability to make values-based decisions and engage in meaningful patterns of activity while accepting

whatever internal sensations (i.e., thoughts and feelings) may arise, including those which may be difficult or uncomfortable to process. Psychological flexibility is often described as the interactions of six processes grouped into three categories: Being Open by practicing *acceptance* and *defusion*; being aware by being *present* and *aware of yourself in context*; and being engaged by being *connected to values* and making *committed action*.²⁹ Given the breadth of psychological flexibility as a construct, much of the research on it focuses on specific component(s) of psychological flexibility or was traditionally measured as the deficits-based construct of psychological inflexibility.³¹ In the present article, we will focus specifically on one strengths-based measurement approach by assessing *values progress* (being engaged, psychological flexibility) and one deficit based approach by assessing *values obstruction* (being open, psychological inflexibility).

Research suggests that psychological flexibility is distinct from its inverse, psychological inflexibility,³² which is conceptualized as the dominance of rigid patterns of behavior seeking to avoid, or otherwise in direct response to, cognitions, emotions, and other internal states.³¹ However, limited research has explored the connections between psychological flexibility (strengths-based, values progress) and psychological inflexibility (deficit-based, values obstruction) among autistic adults. One preliminary study emphasizing measurement of psychological flexibility among 461 autistic adults, cross-sectional data (Time 1 of the data in this study) found a strong positive correlation between psychological flexibility (i.e., values progress) and SWL ($r = .74$) and a medium-strong ($r = -.51$) negative correlation between psychological inflexibility (i.e., values obstruction) and SWL (i.e., values obstruction).³³ To better inform future, strength-based interventions research is needed examining the utility of

psychological flexibility as a strengths-based skill among autistic adults, including whether the construct helps explain how MHC impacts SWL.

Current Study

The current pre-registered study (<https://osf.io/8tc4>) was co-created with stakeholders (i.e., self-advocates, researchers, and clinicians) in the autism community to address, through a strengths-based approach, a potential mechanism of action for autistic adults that can explain changes in SWL while experiencing mental health concerns. The current study examines if components of psychological (in)flexibility, specifically values obstruction (psychological inflexibility, deficit-based) and values progress (psychological flexibility, strengths-based), mediate the association between autistic adults' MHC and SWL. Further, we sought to examine if a strengths-based approach to assessing a component of psychological flexibility (values progress) was more useful in understanding the associations between MHC and SWL for autistic adults compared to the deficit view (values obstruction). The following research questions and hypotheses were preregistered^{II} on OSF:

RQ1: What is the effect of MHC (i.e., depression, anxiety, and stress) at Time 1 (T1) on AAs' SWL at Time 2 (T2; 10 weeks later)?

H1: In line with previous research,^{20,21} we hypothesize that MHC at T1 will be negatively associated with SWL at T2.

Given the previously established importance of psychological flexibility for individuals with a variety of MHC, where components of psychological inflexibility have typically been

^{II} We note one deviation in the research questions presented here from the preregistered research questions. Specifically, and as described in more detail in the descriptive statistics and limitations section, given the high ($r > .80$) correlation between SWL at T1 and SWL at T2, we opted to not control for SWL at T1.

associated with poorer outcomes and components of psychological flexibility have been associated with improved outcomes, we chose to investigate the following research questions:

RQ2a: Is the effect of mental health at T1 on autistic adults' SWL at T2 mediated by their *values obstruction*, a component of psychological inflexibility?

H2a: The association between mental health scores at T1 on autistic adults' SWL at T2 will be mediated by *values obstruction*, a component of psychological inflexibility.

RQ2b: Does the mediation relationship change when looking at *values progress*, a strengths-based component of psychological flexibility, as opposed to values obstruction, a deficit-based component of psychological inflexibility?

H2b: *Values progress* will demonstrate a stronger mediating relationship between mental health scores and SWL than psychological inflexibility.

As previous studies have found significant gender differences for autistic adults across MHC and SWL, but gender differences are not typically observed in psychological flexibility, we chose to investigate the following, final research question:

RQ3: Are the mediation relationships explored in RQ2a and RQ2b moderated by the gender of the participant?

H3: We do not anticipate finding any significant differences in the mediating relationships investigated based on gender.

Methods

Co-Production of Research Study

The current study was coproduced with individuals in the autism community at multiple stages. First, this study was a part of data collection that was grant funded by the National Research Consortium on the Mental Health Aspects of Individuals with Intellectual and

Developmental Disabilities (NRC on MHIDD). As a requirement of receiving funding from the NRC on MHIDD, the study design is reviewed by a participatory action research board composed of self-advocates, family-members, researchers, and clinicians. Feedback that was provided to the research team (i.e., measurement time point lengths, include a strengths-based measure of well-being, and shifting wording of research questions to be framed in the context of COVID-19) was accommodated prior to funding. Next, the grant funded project proposed to collect data via the Research Match Program of the SPARK study.³⁴ As a requirement of the research match program and prior to data collection commencing, all design elements of the study are reviewed by another participatory action research board (autistic self-advocates, family members, and researchers) and amendments to the study design were accommodated (i.e., change formatting of demographic questions). Lastly, the research team on the current study included an autistic researcher (3rd author) and a family-member of an autistic adult that works primarily with autistic adults in mental health therapy (1st author). The team collectively chose a strengths-based journal that emphasized inclusion for the dissemination of results.

Data Collection Procedures

Data for this observational, non-intervention study were collected via the Simons Powering Autism Research (SPARK)³⁴ Research Match program upon receiving approval from the Research Match program and the Utah State University Institutional Review Board (protocol #11537). As required by the research match program, all data collection procedures were completed by Simons Foundation Autism Research Initiative (SFARI) using their online software and database. Participants were required to be 18 years of age or older, self-identify as autistic, have an official diagnosis of autism, be legally independent, and be fluent in English.

Participants were notified of the opportunity to participate in a survey focused on mental health and COVID-19 via email. Interested participants then clicked on a link that directed them to the informed consent. If a participant consented, they were then directed to the survey.

Participation was incentivized with a lottery drawing in which 75 participants received a \$20 Amazon.com electronic giftcard following the completion of the second wave of data collection. Wave 1 of data collection took place between September and November 2021 and Wave 2 took place 10 weeks after participants completed the first survey.

Participants

From September to November 2021, 453 participants completed T1 of the online survey. Ten weeks after participants completed the T1 survey, 306 participants completed the online survey for a second time (61.4% retention rate). On average, the sample was 31 years old ($SD = 7$) and 55% identified as women with 52% identifying as LGBTQIA+. Most (91%) participants identified as not Hispanic or Latinx and 93% identified as White, 3.3% as Black or African American, 5.4% as Native American, and 6% as other^{III}. Most (85%) participants had pursued education beyond a high school degree, while 12% reported having earned a high school degree.

Measures

Independent Variables

MHC—Depression, Anxiety, and Stress. We used the Depression, Anxiety, and Stress Scale (DASS-21) to measure participants' mental health concerns over the week preceding survey completion.³⁵ The DASS-21 has been standardized for autistic adults³⁶ and includes three subscales (7 items each) to assess depression, anxiety, and stress; in our analysis, we looked at these three subscales separately. All questions relied on a 4-point Likert scale ranging from 1 =

^{III} The total of these groups adds up to more than 100% as individuals could select more than one race.

Never to 4 = *Almost Always*. The base instructions stated, “Please read each statement and select the option that indicates how much the statement applied to you over the last week. There are no right or wrong answers. Do not spend too much time on any one statement.” Examples from the stress subscale include, “I found it hard to wind down” and “I felt that I was using a lot of nervous energy.” The depression subscale included statements such as, “I couldn’t seem to experience any positive feeling at all” and “I felt that I had nothing to look forward to.” The anxiety subscale included items such as, “I felt I was close to panic” and “I was aware of dryness of my mouth.” At T1, Cronbach’s alpha was $\alpha = .85$, $\alpha = .91$, and $\alpha = .80$ for the stress, depression, and anxiety subscales, respectively, suggesting good reliability of the measure within the current sample.

Psychological (In)flexibility—Valuing Questionnaire. We used the Valuing Questionnaire (VQ),³⁷ a 10-item measure that assesses an individual’s values obstruction and values progress over the past week. The VQ, standardized with autistic adults and demonstrating both strong validity and reliability properties³³ uses a 7-point Likert scale ranging from 0 = *Not at all True* to 6 = *Completely true*. The VQ includes two subscales, the *Values Progress* subscale (higher scores = higher values progress, an indicator of psychological *flexibility*) and the *Values Obstruction* sub-scale (higher scores = higher values obstruction, an indicator of psychological *inflexibility*). A sample item from the Values Progress subscale is, “I continued to get better at being the kind of person I want to be” while a sample item from the VQ Obstruction subscale is, “Difficult thoughts, feelings or memories got in the way of what I really wanted to do”. Cronbach’s alpha was $\alpha = .86$ at T2 for the Values Progress subscale and $\alpha = .84$ at T2 for the Values Obstruction subscale, indicating good reliability within the current sample. While there are several scales that have been used to measure psychological inflexibility such as the

Acceptance and Action Questionnaire-II (AAQ-II) and the Brief Experiential Avoidance Questionnaire (BEAQ), previous research from this dataset has suggested that the VQ is the best measure of psychological (in)flexibility, and as such, was used in this analysis.³³

Gender. To measure gender, we asked, “How do you currently describe your gender identity?” Participants were able to select one of the following eight options: 1 = Man, male, or masculine; 2 = Transgender man, male, or masculine; 3 = Transgender woman, female, or feminine; 4 = Woman, female, or feminine; 5 = Gender nonconforming, genderqueer, or gender questioning; 6 = Intersex, disorders or sex development, two-spirit, or other related terms; 7 = No response; 8 = I prefer not to answer. Given the small cell sizes in some of these categories, we recoded gender into three categories. Those who selected “No response” and “I prefer not to answer” were recoded as missing, while those who identified as a “Man, male, or masculine” were code as “Man”, those who identified as “Woman, female, or feminine” were coded as “Woman” and all other groups were recoded as “Gender nonconforming.” This resulted in 53% percent of the sample identifying as women, 27% as men, and 20% as gender nonconforming.

Control Variables. We controlled for a number of salient demographic variables including race and ethnicity, education, age, and gender.

Dependent Variable

Satisfaction with Life. The Satisfaction with Life Scale,³⁸ that has demonstrated strong internal consistency and reliability among autistic adults,³⁹ was used to assess participants’ general SWL. Participants responded on a 7-point Likert scale (1 = *Strongly disagree*, 7 = *Strongly agree*). These items included statements such as, “In most ways, my life is close to my ideal” and “The conditions of my life are excellent.” Cronbach’s alpha was $\alpha = .89$ at T2.

Analytic Approach

To handle missing data, only participants who completed 95% or more of the items for the main measures (VQ, DASS-21, and SWL-5) were included in the analyses, resulting in a total sample size of 289 participants. Item-level missing values were handled using full-information maximum likelihood. All analyses were completed in R 4.2.2.⁴⁰ To assess significance, we used likelihood ratio tests and other maximum likelihood tests using *p*-values. Alpha was set at the standard $p < 0.05$.

Structural equation modeling (SEM) was used to test H1 and assess the standardized associations between the depression, anxiety, and stress latent variables at T1 and the satisfaction with life latent variable at T2, while controlling for demographic variables. While we had planned to control for SWL at T1, and ran models with it included, the high correlation ($r > .80$) between SWL at T1 and SWL at T2 resulted in a lack of available variance, thus hiding significant correlations between other variables and SWL at T2. Thus, and given our interest in also understanding the longitudinal associations between our variables, we chose to not control for SWL at T1.

SEM was also used to test H2a and assess the mediated relation between depression, anxiety, and stress latent variables at T1 (predictor) and the latent variable of psychological inflexibility at T2 (mediator) and the latent variable of satisfaction with life scores at T2 (outcome), continuing to control for demographic variables. Similar to H2a, to test H2b, we replaced psychological inflexibility with values progress as the mediator. We then compared the standardized indirect effects of psychological inflexibility and values progress using likelihood ratio tests and a qualitative comparison of the standardized indirect effect sizes.

Two separate moderated mediation models were used to assess H3 in which gender was interacted with depression, anxiety, and stress as well as the two mediators (values obstruction in

one model and values progress in the other model). Measurement invariance of the coefficients (indirect and direct effects), in which the model without the interaction is compared to the model with the interaction term, was used to test for the differences by gender identity. This proposed model is diagrammed in Figure 1.

[Insert Figure 1 About Here]

Results

Descriptive Results

Means, standard deviations, and bivariate correlations are reported in Table 1. All correlations were in the direction anticipated. Further, we note the strong correlation of $r = .83$ between SWL at T1 and SWL at T2. When we controlled for SWL at T1 in our models, it was so strongly correlated with SWL at T2 that it masked significant associations between other variables and SWL at T2. Thus, we excluded SWL at T1 from all analyses reported in this manuscript. This means that we are only able to look at the associations over time between mental health, values progress and values obstruction, and SWL rather than how change in SWL is impacted by these variables.

[Insert Table 1 Here]

Structural Equation Models

We assessed the model fit and factor loadings for each of our latent variables. For SWL at T2, the model appeared to fit the data well ($\chi^2(5) = 13.93, p = .016, CFI = .990, TLI = .979, RMSEA = .079, SRMR = .018$) based on standard criteria of a $CFI > .95$ and a $SRMR < .08$ (Hu & Bentler, 1999). While some scholars would deem an $RMSEA > .07$ as indicative of a poorly fit model, others view an $RMSEA$ less than .08 or even .10 as acceptable.⁴¹ All factor loadings were above .5. The valuing questionnaire latent variable at T2 similarly appeared to fit the data

well, ($\chi^2(34) = 89.314, p < .001, CFI = .958, TLI = .944, RMSEA = .075, SRMR = .043$). All factor loadings were above .5. In regard to the DASS-21 latent variable model, there were some concerns regarding how well the model fit the data ($\chi^2(186) = 504.613, p < .001, CFI = .898, TLI = .885, RMSEA = .077, SRMR = .058$), with the CFI being slightly below the more outdated cutoff of .90.⁴² Further, we note that one of the items on the anxiety subscale had a factor loading of .344 which is below the standard cutoff of .4; all other factor loadings were above .4. Despite these concerns, as other indicators such as the RMSEA and SRMR were within acceptable range and given the strong validity for the DASS-21 scale established in previous research,^{36,43} we retained it for use in our analyses.

RQ1: T1 Mental Health Scores and T2 SWL

We assessed whether depression, stress, and anxiety at T1 were associated with satisfaction with life at T2. While stress ($\beta = 0.039, p = .877$) and anxiety ($\beta = 0.151, p = .425$) were not significantly associated with SWL, depression was strongly associated with SWL ($\beta = -0.612, p < .001$), providing partial support for H1. None of the control variables were significantly associated with SWL except identifying as gender nonconforming; compared to those who identified as men, identifying as gender nonconforming was negatively associated with SWL ($\beta = -0.131, p = .046$).

RQ2: Psychological (In)Flexibility as a Mediator Between Mental Health Scores and SWL

We found that while a direct association between depression at T1 and SWL at T2 remained significant ($\beta = -0.451, p < .001$; see Figure 2) when accounting for values obstruction, we also identified a significant indirect association between depression and SWL through values obstruction ($ab = -.159, p = .039$), showing that values obstruction partially mediated the association between depression and SWL, supporting H2b

[Insert Figure 2 About Here]

In looking at values progress, we found that the direct association between depression and SWL was no longer statistically significant when values progress was included in the model ($\beta = -0.118, p = .142$; see Figure 3), and that depression had an indirect association with SWL through values progress ($ab = -.487, p < .001$). To better understand the mediating role of values progress and values obstruction, we ran an additional model with both values obstruction and values progress included together. In this model, values progress ($\beta = 0.746, p < .001$), remained significant above and beyond values obstruction ($\beta = -0.111, p = .199$), which was no longer significant, supporting H2b.

[Insert Figure 3 About Here]

RQ3: The Moderating Role of Gender

Two separate moderated mediation models were used to assess whether gender (i.e., man, woman, and gender nonconforming) interacted with depression, anxiety, and stress as well as the indirect effects for the two mediators. The first model included values obstruction as the mediator while the second included values progress as the mediator. A form of measurement invariance models was used to test for the differences in indirect effects by gender identity. Gender did not moderate any of the direct or indirect effects in either the values obstruction or values progress model, supporting H3.

Discussion

The current study, co-created with stakeholders (i.e., self-advocates, researchers, and clinicians) within the autism community, sought to elucidate how a strengths-based mechanism—values progress—might explain the relation between mental health concerns and satisfaction with life among autistic adults. We examined how values progress (a strengths-based

component of psychological flexibility) and values obstruction (a component of psychological inflexibility, a deficits-based construct) mediated the relation between autistic adults' MHC and their SWL. In sum, we found that for autistic adults experiencing depressive symptoms, their values progress (i.e., ability to connect their actions to meaningful qualities or values) explained the effects of depression on their SWL. Values obstruction similarly had a mediating influence between depressive symptoms and satisfaction with life, however, this effect was weaker, as depression continued to be significantly associated with SWL. In other words, values progress, the strengths-based construct, was more useful in explaining the association between depressive symptoms and SWL among autistic adults. The following sections consider these results and their relative contributions to both research and clinical fields.

Strengths-based Approaches to Promoting Mental Health for Autistic Adults

Over the past decade, it has become increasingly apparent and accepted that the psychological sciences need to emphasize more strengths-based approaches to supporting the mental health of autistic adults.^{27-28,44} As such, it is important to note that we purposefully examined relative contributions of both values progress (strengths-based) and values obstruction (deficit-based) and how they may explain the association between MHC and SWL. Results from our study suggest that while both constructs were useful in explaining the association between experiencing depressive symptoms and satisfaction with life among autistic adults, values progress was statistically more useful in explaining this association. These results provide initial support for future research emphasizing or solely focusing on strengths-based constructs as they tend to be more accepted by the autism community and appear to provide similar or potentially stronger explanatory power in the context of psychological flexibility. Noting that the current study lends quantitative support to the many calls from stakeholders in the autism community

toward more strengths-based practices should not be under-valued.⁴⁴⁻⁴⁶ We hope to see more research focused on strengths-based constructs, that shift away from viewing autism as a deficit to be corrected, and additional therapy approaches that emphasize connecting autistic adults to what they care about most.¹⁴

Future Research Directions

While results of the study supported values-progress, a component of psychological flexibility, as explaining the effects of mental health concerns on satisfaction with life, somewhat surprisingly, this was only for autistic adults currently reporting depressive symptoms. In this study, experiencing higher levels of anxiety and/or stress was not statistically significantly associated with autistic adults' SWL . This might be in part due to autistic adults' higher baseline presentations of anxiety¹⁶ and unique non-DSM-5 related ways anxiety is expressed among autistic adults,¹⁷ which may lead to a lack of sensitivity in our measures of how anxiety and stress impact satisfaction with life for autistic adults. The lack of significant associations between anxiety, stress, and satisfaction with life may also be related to the covariance between the DASS-21 subscales; although these subscales do measure the three distinct dimensions of anxiety, stress, depression, they are also all indicators of general psychological distress.⁴³ Future research is needed to assess this further, however, it is important to again emphasize that future research should focus on how to improve satisfaction with life rather than on understanding 'deficits.' Accordingly, future investigation should carefully balance needs to understand how MHC covary for autistic adults with how to improve overall satisfaction with life.

Future Clinical Directions

Increasingly more evidence supports the potential utility of ACT, more specifically the values progress component of psychological flexibility, in supporting the mental health of

individuals with varying disabilities and their caregivers.⁴⁷⁻⁵⁰ This extant literature, combined with results from this study, provide rationale to begin collaboratively working with stakeholders from the autism community to co-create and adapt existing ACT-based interventions to promote satisfaction with life rather than solely focusing on decreasing psychopathology. This shift away from pathology to, ‘what works’ is likely a welcome change to treatment approaches within the autism community as DSM-5 targeted treatments tend to overshadow quality of life improvements, preferring DSM-5 symptom reduction that may not be desired by autistic adults.^{8,45} While results from this study suggest that starting this work with autistic adults experiencing depressive symptoms might be most useful, the transdiagnostic nature of ACT provides a robust clinical framework by which to address satisfaction of life regardless of other MHC autistic adults may be experiencing. Future clinical work will likely benefit from this more strengths-based orientation to promoting satisfaction with life while also addressing the consistent calls to action of the autism community to emphasize more strengths-based approaches.²⁸

Limitations

There were several salient limitations of this study, including that it is not generalizable. First, there was a lack of racial and ethnic diversity in our sample, with 93% of the sample identifying as White. Further diverging from the demographics of the United States, we note that 52% of the sample identified as LGBTQIA+. While autistic adults are more likely than the general population to identify as LGBTQIA+, and that accurate prevalence estimates are lacking, we note that this number is particularly high as illustrated by it being 11% higher than 2023 study of 641 autistic adults that similarly relied on the Simons Powering Autism Research's Research Match for recruitment found that 41% of their sample had a sexual minority identify.⁵⁰

Second, there was a high correlation between the DASS-21 subscales and T1 and T2. This high correlation masked other significant correlations, and thus we did not control for MHC at T1. This means that we were only able to investigate associations over time and were not able to assess change over time. Relatedly, we collected only two waves of data, and this data collection took place in the fall 2021, a time in which COVID-19 was still creating major disruptions in many people's lives. Reassessing these research questions, now that we have reached a new normal in most areas of the United States would be valuable. Further, future research which seeks to assess changes in satisfaction with life related to MHC and psychological flexibility should consider collecting additional waves of data.

While this study provided support for values progress as a way to support satisfaction with life amidst MHC for autistic adults, our quantitative approach is unable to provide insights into *why* these associations exist, beyond the theorized connections. Qualitative research focused on how autistic adults experience the intersection of MHC, psychological flexibility, and satisfaction with life would help provide more insights into why and how psychological flexibility acts as a support for satisfaction with life when individuals are experiencing MHC.

Conclusion

We sought to better understand how a strengths-based construct, psychological flexibility, may provide insights into the association between MHC and satisfaction with life among autistic adults. While results of this study are preliminary, this work in conjunction with previous research in the extant literature suggests values progress, a component of psychological flexibility, is a valuable construct to target in interventions focused on improving overall life satisfaction, and thus, that ACT might be a useful approach to improve satisfaction of life for autistic adults. Future collaborations amongst stakeholders within the autism community may

benefit from leveraging this strengths-based approach and the clinical model of ACT for autistic adults.

Authorship Contribution Statement

The first and third authors led the original grant project that created the study design. The first author collaborated with the SPARK research team to complete data collection. The first, second, and fourth authors created the research questions and the third, fifth, and sixth authors provided feedback on the questions prior to submitting the pre-registration to the OSF repository (<https://osf.io/8tc4>). The third author completed all code and data analysis and management of the OSF repository materials. The first, second, third, and fourth authors all wrote independent sections of the first draft of the article. In addition to helping refine the initial grant proposal, the fifth and sixth authors edited and provided intellectual contributions to shape the current article interpretation and presentation. All coauthors revised the article for critical content and approved the final version. This article has been submitted solely to this journal and is not published elsewhere.

Author Disclosure Statement

No competing financial interests exist.

Funding Information

Data collected and analyzed in the current study was part of a grant funded by the National Research Consortium on the Mental Health Aspects of Individuals with Intellectual and Developmental Disabilities.

References

1. Dietz PM, Rose CE, McArthur D, Maenner M. National and state estimates of adults with autism spectrum disorder. *J Autism Dev Disord.* 2020;50(12):4258-4266.
<https://doi.org/10.1007/s10803-020-04494-4>
2. Kirby AV, Bakian AV, Zhang Y, Bilder DA, Keeshin BR, Coon H. A 20-year study of suicide death in a statewide autism population. *Autism Res.* 2019;12(4):658–666.
<https://doi.org/10.1002/aur.2076>
3. Lai MC, Kasseh C, Besney R, Bonato S, Hull L, Mandy W, et al. Prevalence of co-occurring mental health diagnoses in the autism population: a systematic review and meta-analysis. *Lancet Psychiatry.* 2019;6(10):819-829. [https://doi.org/10.1016/S2215-0366\(19\)30289-5](https://doi.org/10.1016/S2215-0366(19)30289-5)
4. Zaloski & Storch, 2018
5. Adams D, Young K. A systematic review of the perceived barriers and facilitators to accessing psychological treatment for mental health problems in individuals on the autism spectrum. *J Autism and Dev Disord.* 2020;1-18.
6. Bennett AE, Miller JS, Stollon N, Prasad R, Blum NJ. Autism spectrum disorder and transition-aged youth. *Curr Psychiatry Rep.* 2018;20:1-9. <https://doi.org/10.1007/s11920-018-0967-y>
7. Brede J, Cage E, Trott J, et al. "We Have to Try to Find a Way, a Clinical Bridge"-Autistic adults' experience of accessing and receiving support for mental health difficulties: A systematic review and thematic meta-synthesis. *Clin Psychol Rev.* 2022;93:102131.
8. Camm-Crosbie L, Bradley L, Shaw R, Baron-Cohen S, Cassidy S. 'People like me don't get support': Autistic adults' experiences of support and treatment for mental health difficulties, self-

injury and suicidality. *Autism*. 2019;23(6):1431-1441.

<https://doi.org/10.1177/1362361318816053>

9. Gloster AT, Meyer AH, Lieb R. Psychological flexibility as a malleable public health target: Evidence from a representative sample. *J Contextual Behav Sci*. 2017;6(2):166-171.

10. Byrne G, O'Mahony T. Acceptance and commitment therapy (ACT) for adults with intellectual disabilities and/or autism spectrum conditions (ASC): A systematic review. *J Contextual Behav Sci*. 2020;18:247-255. <https://doi.org/10.1016/j.jcbs.2020.10.001>

11. Suarez VD, Moon EI, Najdowski AC. Systematic review of acceptance and commitment training components in the behavioral intervention of individuals with autism and developmental disorders. *Behav Anal Pract*. 2022;15(1):126-140.

12. Levin ME, Krafft J, Hicks ET, Pierce B, Twohig MP. A randomized dismantling trial of the open and engaged components of acceptance and commitment therapy in an online intervention for distressed college students. *Behav Res Ther*. 2020;126:103557.

<https://doi.org/10.1016/j.brat.2020.103557>

13. Hollocks MJ, Lerh JW, Magiati I, Meiser-Stedman R, Brugha TS. Anxiety and depression in adults with autism spectrum disorder: A systematic review and meta-analysis. *Psychol Med*. 2019;49(4):559-572. <https://doi.org/10.1017/S003329>

14. McVey AJ, Jones DR, Waisman TC, Raymaker DM, Nicolaidis C, Maddox BB. Mindshift in autism: a call to professionals in research, clinical, and educational settings. *Front Psychiatry*. 2023;14. <https://doi.org/10.3389/fpsy.2023.1251058>

15. Jordan AL, Marczak M, Knibbs J. 'I felt like I was floating in space': Autistic adults' experiences of low mood and depression. *J Autism Dev Disord*. 2021;51(5):1683–1694.

<https://doi.org/10.1007/s10803-020-04638-6>

16. Jolliffe R, Adams D, Simpson K. Trait anxiety in individuals on the autism spectrum: A systematic review. *Rev J Autism Dev Disord*. 2022;1-23. <https://doi.org/10.1007/s40489-022-00308-8>
17. Halim AT, Richdale AL, Uljarević M. Exploring the nature of anxiety in young adults on the autism spectrum: A qualitative study. *Res Autism Spectr Disord*. 2018;55:25-37. <https://doi.org/10.1016/j.rasd.2018.07.006>
18. Andersson P, Jarbin H, Boström AED. Sex Differences in Mental Health Problems and Psychiatric Hospitalization in Autistic Young Adults. *JAMA Psychiatry*. 2023;80(4):400-401.
19. Strauss P, Cook A, Watson V, Winter S, Whitehouse A, Albrecht N, et al. Mental health difficulties among trans and gender diverse young people with an autism spectrum disorder (ASD): Findings from Trans Pathways. *J Psychiatr Res*. 2021;137:360-367.
20. Lawson LP, Richdale AL, Haschek A, Flower RL, Vartuli J, Arnold SR, Trollor JN. Cross-sectional and longitudinal predictors of quality of life in autistic individuals from adolescence to adulthood: The role of mental health and sleep quality. *Autism*. 2020;24(4):954-967.
21. Graham Holmes L, Zampella CJ, Clements C, McCleery JP, Maddox BB, Parish-Morris J, et al. A lifespan approach to patient-reported outcomes and quality of life for people on the autism spectrum. *Autism Res*. 2020;13(6):970-987.
22. Park SH, Song YJC, Demetriou EA, Pepper KL, Norton A, Thomas EE, et al. Disability, functioning, and quality of life among treatment-seeking young autistic adults and its relation to depression, anxiety, and stress. *Autism*. 2019;23(7):1675-1686. <https://doi.org/10.1177/1362361318823925>

23. Hirvikoski T, Mittendorfer-Rutz E, Boman M, Larsson H, Lichtenstein P, Bölte S. Premature mortality in autism spectrum disorder. *Br J Psychiatry*. 2016;208(3):232-238.

<https://doi.org/10.1192/bjp.bp.114.160192>

24. Bishop-Fitzpatrick L, Hong J, Smith LE, Makuch RA, Greenberg JS, Mailick MR. Characterizing objective quality of life and normative outcomes in adults with autism spectrum disorder: An exploratory latent class analysis. *J Autism Dev Disord*. 2016;46:2707-2719.

<https://doi.org/10.1007/s10803-016-2816-3>

25. Lipscomb S, Hamison J, Burghardt J, Johnson DR, Thurlow M. Preparing for Life after High School: The Characteristics and Experiences of Youth in Special Education. Findings from the National Longitudinal Transition Study 2012. Volume 2: Comparisons across Disability Groups. Full Report. NCEE 2017-4018. National Center for Education Evaluation and Regional Assistance. 2017.

26. Wei Y, McGrath PJ, Hayden J, Kutcher S. Mental health literacy measures evaluating knowledge, attitudes and help-seeking: a scoping review. *BMC Psychiatry*. 2015;15(1):1-20.

27. Interagency Autism Coordinating Committee (IACC). 2016–2017 *Interagency Autism Coordinating Committee strategic plan for autism spectrum disorder*. U.S. Department of Health and Human Services Interagency Autism Coordinating Committee.

<https://iacc.hhs.gov/publications/strategic-plan/2017/>

28. Urbanowicz A, Nicolaidis C, Houting JD, Shore SM, Gaudion K, Girdler S, Savarese RJ. An expert discussion on strengths-based approaches in autism. *Autism Adulthood*. 2019;1(2):82-89.

<https://doi.org/10.1089%2Faut.2019.29002.aju>

29. Hayes SC, Pistorello J, Levin ME. Acceptance and commitment therapy as a unified model of behavior change. *Couns Psychol*. 2012;40(7):976-1002.

<https://doi.org/10.1177/0011000012460836>

30. Stockton D, Kellett S, Berrios R, Sirois F, Wilkinson N, Miles G. Identifying the underlying mechanisms of change during acceptance and commitment therapy (ACT): a systematic review of contemporary mediation studies. *Behav Cogn Psychother*. 2019;47(3):332-362.

<https://doi.org/10.1017/S1352465818000553>

31. Cherry KM, Vander Hoeven E, Patterson TS, Lumley MN. Defining and measuring “psychological flexibility”: A narrative scoping review of diverse flexibility and rigidity constructs and perspectives. *Clin Psychol Rev*. 20. 21;84:101973.

<https://doi.org/10.1016/j.cpr.2021.101973>

32. Rolffs JL, Rogge RD, Wilson KG. Disentangling components of flexibility via the hexaflex model: Development and validation of the Multidimensional Psychological Flexibility Inventory (MPFI). *Assessment*. 2018;25(4):458-482.

33. Aller TB, Barrett T, Levin M, McClain MB. Measuring psychological flexibility in autistic adults: Examining the validity and reliability of the AAQ-II, BEAQ, and VQ. *J Contextual Behav Sci*. 2022;26(1):125-133. <https://doi.org/10.1016/j.jcbs.2022.09.001>

34. Feliciano P, Daniels AM, Snyder LG, Beaumont A, Camba A, Esler A, et al. SPARK: A US cohort of 50,000 families to accelerate autism research. *Neuron*. 2018;97(3):488-493.

<https://doi.org/10.1016/j.neuron.2018.01.015>

35. Lovibond PF, Lovibond SH. The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories.

Behav Res Ther. 1995;33(3):335-343. [https://doi.org/10.1016/0005-7967\(94\)00075-U](https://doi.org/10.1016/0005-7967(94)00075-U)

36. Park SH, Song YJC, Demetriou EA, Pepper KL, Thomas EE, Hickie IB, Guastella AJ. Validation of the 21-item Depression, Anxiety, and Stress Scales (DASS-21) in individuals with autism spectrum disorder. *Psychiatry Res.* 2020;291:113300. <https://doi.org/10.1016/j.psychres.2020.113300>
37. Smout M, Davies M, Burns N, Christie A. Development of the valuing questionnaire (VQ). *J Contextual Behav Sci.* 2014;3(3):164-172. <https://doi.org/10.1016/j.jcbs.2014.06.001>
38. Diener ED, Emmons RA, Larsen RJ, Griffin S. The satisfaction with life scale. *J Pers Assess.* 1985;49(1):71-75. https://doi.org/10.1207/s15327752jpa4901_13
39. Beck KB, Terhorst LA, Greco CM, Kulzer JL, Skidmore ER, McCue MP. Item understanding of common quality of life measures for use with autistic adults. *J Autism Dev Disord.* 2023:1-11. <https://doi.org/10.1007/s10803-023-05945-4>
40. R Core Team. R: A language and environment for statistical computing. 2022 <https://www.R-project.org/>
41. Little TD. *Longitudinal structural equation modeling.* Guilford press.
42. Hu LT, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Struct Equ Modeling.* 1999;6(1):1-55.
43. Henry JD, Crawford JR. The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large non-clinical sample. *Br J Clin Psychol.* 2005;44(2):227-239. <https://doi.org/10.1348/014466505X29657>
44. Roche L, Adams D, Clark M. Research priorities of the autism community: A systematic review of key stakeholder perspectives. *Autism.* 2021;25(2):336-348.

45. Benevides TW, Shore SM, Palmer K, Duncan P, Plank A, Andresen ML, et al. Listening to the autistic voice: Mental health priorities to guide research and practice in autism from a stakeholder-driven project. *Autism*. 2020;24(4):822-833.
46. Gotham K, Marvin AR, Taylor JL, Warren Z, Anderson CM, Law PA, et al. Characterizing the daily life, needs, and priorities of adults with autism spectrum disorder from Interactive Autism Network data. *Autism*. 2015;19(7):794-804.
47. Ecija C, Catala P, Lopez-Gomez I, Bedmar D, Peñacoba C. What does the psychological flexibility model contribute to the relationship between depression and disability in chronic pain? The role of cognitive fusion and pain acceptance. *Clin Nurs Res*. 2022;31(2):217-229.
48. Gur A, Reich A. Psychological flexibility of parents of children with disabilities: A systematic literature review. *Res Dev Disabil*. 2023;136:104490.
49. Meyer EC, Frankfurt SB, Kimbrel NA, DeBeer BB, Gulliver SB, Morrisette SB. The influence of mindfulness, self-compassion, psychological flexibility, and posttraumatic stress disorder on disability and quality of life over time in war veterans. *J Clin Psychol*. 2018;74(7):1272-1280.
50. Pyszkowska A, Stojek MM. Early maladaptive schemas and self-stigma in people with physical disabilities: The role of self-compassion and psychological flexibility. *Int J Environ Res Public Health*. 2022;19(17):10854.
51. McQuaid, G. A., Gendy, J., Lee, N. R., & Wallace, G. L. (2023). Sexual minority identities in autistic adults: Diversity and associations with mental health symptoms and subjective quality of life. *Autism in Adulthood*, 5(2), 139-153.

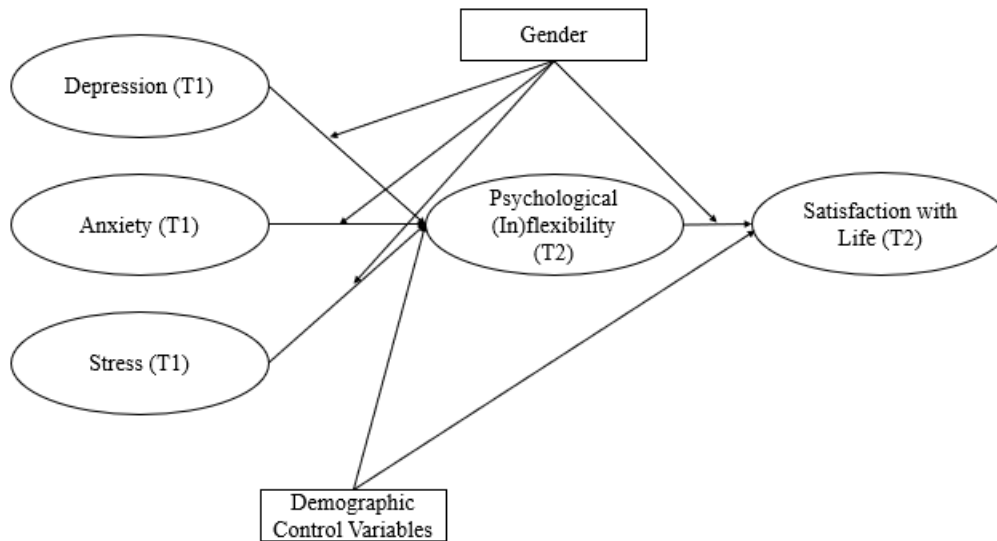
Table 1.*Bivariate Correlations, Means, Standard Deviations, and Ranges*

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Depression T1	1.000						
(2) Stress T1	0.595***	1.000					
(3) Anxiety T1	0.495***	0.753***	1.000				
(4) Values Progress T2	-0.506***	-0.241***	-0.185**	1.000			
(5) Values Obstruction T2	0.617***	0.529***	0.499***	-0.449***	1.000		
(6) Satisfaction with Life T1	-0.528***	-0.215***	-0.123**	0.587***	-0.354***	1.000	
(7) Satisfaction with Life T2	-0.482***	-0.216***	-0.146**	0.677***	-0.410***	0.835***	1.000
Mean	2.07	2.37	1.97	4.39	4.25	3.57	3.53
Standard Deviation	0.77	0.68	0.64	1.37	2.36	1.56	1.51
Range	1-4	1-4	1-4	1-7	1-7	1-7	1-7

*** $p < .001$, ** $p < .05$, * $p < .01$

Figure 1.

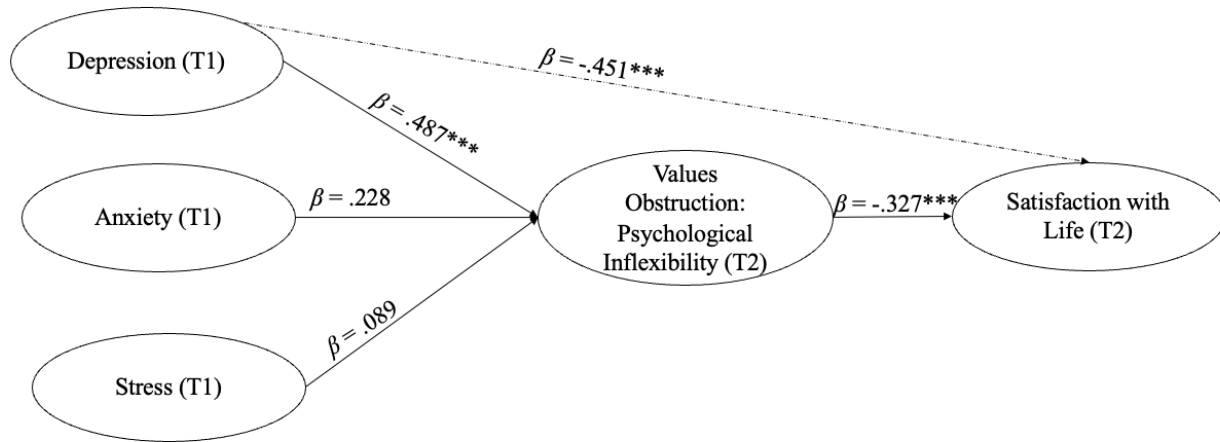
Proposed Structural Moderated Meditation Model



Note: Ovals represent latent variables while rectangles represent observed variables.

Figure 2.

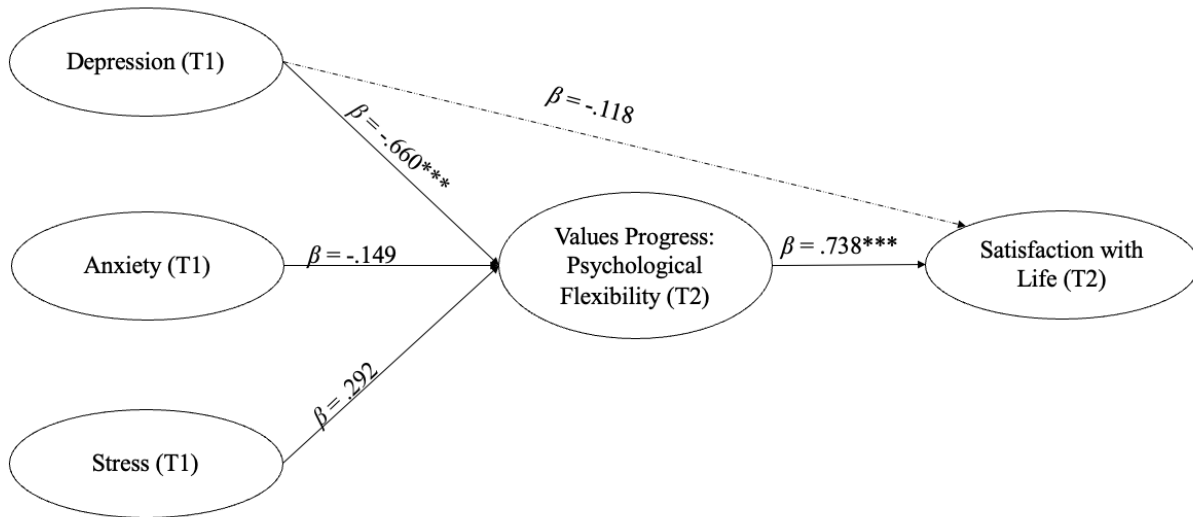
Depression, Satisfaction with Life, and Values Obstruction Mediation Model



Note: For brevity and model clarity, control variables are not pictured. We found a significant negative association between being in the gender nonconforming group and satisfaction with life ($\beta = -0.148, p = .021$). All other associations were not significant.

Figure 3.

Depression, Satisfaction with Life, and Values Progress Mediation Model



Note: For brevity and model clarity, control variables are not pictured; none of the control variables included in this model were statistically significant.