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ARTICLE

Pre-disability resilience and well-being following the onset of functional impairments

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Abstract

Objectives: Tested the prospective relationship of a resilient personality prototype determined prior to disability onset to well-being among persons with and without debilitating functional impairments nine to 10 years later. A resilient profile was expected to predict well-being through its beneficial associations with positive affect, perceived control and social support.

Design: Longitudinal, prospective observation study.

Methods: Data obtained from participants with no functional impairments at the first assessment of the Midlife in the United States (MIDUS) project and who participated in the second survey (1147 men, 985 women at Time 1). Cluster analysis was used to create personality profiles at the first time point. Differences between resilient and non-resilient individuals were examined. A structural equation model (SEM) tested the prospective effects of resilience on positive affect, perceived control and social support to well-being.

Results: A resilient personality profile was identified, as expected ($n = 877$). Individuals with a resilient personality prototype reported higher social support, positive affect, perceived control, life satisfaction and self-rated health at both measurement occasions than the non-resilient group. The SEM revealed that a resilient prototype operated through the three mediating variables to prospectively predict life satisfaction, and through social support and positive affect to predict self-rated health. These effects were independent of gender and disability severity.

Conclusions: A resilient personality profile prospectively operates through positive affect, perceived control and

social support to predict well-being following the onset of debilitating impairments. The theoretical and clinical implications of these findings are discussed, and limitations are considered.

KEYWORDS

disability, personality, personal control, positive emotion, resilience, well-being

INTRODUCTION

Many individuals who incur debilitating health problems appear to be remarkably resilient, reporting lower distress and higher levels of well-being and quality of life than clinically anticipated (Dunn et al., 2021). In this literature, resilience is sometimes construed as a self-reported characteristic of the individual that inversely correlates with distress and positively with life satisfaction and quality of life, regardless of disability severity (Kasser & Zia, 2020; White et al., 2010), although these relationships appear to be sensitive to fluctuations in mood and social support over time (Laird et al., 2019) and arguably lack predictive validity (Bonanno, 2021). Longitudinal studies that define resilience as a process of adjustment in the wake of a potentially stressful event (Bonanno et al., 2011) find most persons who incur traumatic-onset disabilities evidence lower levels of distress over 6 months (deRoon-Cassini et al., 2010) and 2 years (Bonanno et al., 2012) after medical discharge. Whether conceptualized as an individual characteristic or as a process of adjustment over time, this work relies exclusively on measures administered after the onset of disability. Consequently, we do not know the degree to which participant responses might be contaminated by the real-life changes that accompany declines in personal health and concomitant functional impairments.

There is some evidence that pre-disability personality traits predict well-being following the onset of disability, but the mechanisms through which this occurs are unclear (Boyce & Wood, 2011). Of the non-pathological five factor traits, Boyce and Wood (2011) found agreeableness to be the only one to uniquely predict higher life satisfaction in the years following disability onset, and the authors speculated the prosocial characteristics associated with this trait – warmth, friendliness, sociability, co-operation – might facilitate well-being through presumed benefits on social and interpersonal support systems. One theoretical model of resilience offers a priori explanations of the ways through which the five factor traits may operate to facilitate adjustment. The Block and Block (1980) developmental model of personality asserts that nurturing, healthy attachments from infancy through childhood foster a heightened sense of ego control (EC) and ego resiliency (ER) in the individual. The former serves to maintain goal-directed behaviour through perseverance and emotional regulation; the latter reflects a person's capacity to be flexible, resourceful and engage in prosocial behaviours as necessary to attain higher-order goals. Both operate in tandem for an individual to adapt to challenges and transitions.

A series of longitudinal studies provided considerable support for the model, finding that children and adolescents rated high in characteristics associated with EC and ER displayed more optimal social, emotional and physical health outcomes in adulthood than those who were low in these characteristics (Caspi, 2000; Chapman & Goldberg, 2011; Dennissen et al., 2008). These individuals were described as having a resilient personality profile, which was characterized by distinct patterns in the five factor personality traits: higher elevations on Agreeableness, Openness to Experience, Conscientiousness and Extraversion, and lower than average scores on Neuroticism (Asendorpf et al., 2001; Robins et al., 1996). This conceptualization permits the study of trait profiles as an independent variable, guided by a person-centred approach that recognizes the organization and interplay of traits within the individual rather than focus on a specific trait (Block, 1971; pp. 12–13). In this manner, clinically relevant behavioural and interpersonal resources can distinguish individuals with a resilient profile from those who do not. This information can then be used to develop

interventions to help those at risk for complicated adjustment to acquire behaviours and marshal resources that characterize resilience. The Block model continues to be used in this fashion to identify the adaptive behaviours of resilient children as they age into adolescence to determine strategies that may help the interpersonal and socio-emotional functioning and academic performance of children who do not have this profile (Shi et al., 2021).

Systematic study of this model among persons living with chronic and debilitating health conditions illustrates the kind of theoretically consistent and clinically informative differences between those with and without a resilient personality profile. Cross-sectional studies of individuals with severe physical disabilities found those with a resilient prototype reported a greater use of personal strengths, a higher sense of gratitude and meaning in life (Wade et al., 2023) and more effective problem-solving abilities (Berry et al., 2007) than their peers with a non-resilient profile. Similarly, warzone veterans with a resilient profile reported more sleep and health behaviours, more stress management techniques, greater emotional distress tolerance and higher self-reported resilience scores than those with a non-resilient profile (Elliott et al., 2017). A resilient profile among veterans with and without traumatic brain injury operated through greater psychological flexibility and higher social support to predict lower depression and post-traumatic stress symptoms over eight (Elliott et al., 2015) and 12 months (Elliott et al., 2019). Similar effects were found among emerging adults with chronic health conditions: A resilient profile predicted lower distress over a period of 8 years through its beneficial associations on personal control (Wright et al., 2023). In contrast, individuals with chronic health conditions and a non-resilient profile reported more COVID-19 fears and subsequent use of avoidant coping strategies, which predicted heightened distress over 3 months (Elliott et al., 2024).

With few exceptions (quality of life, Elliott et al., 2019; positive mental health, Wade et al., 2023), these studies focused on the prediction of distress at the expense of indicators of well-being and all relied on self-report measures administered after the onset of the disabling condition. Although these features demonstrate the potential utility of this conceptualization of the non-pathological five factor traits in these clinical scenarios, and the results provide evidence for the self-regulatory and prosocial capacities theoretically associated with the resilient prototype, further study is needed to determine if personality prototypes assessed prior to the onset of debilitating declines in health predict well-being after the lived experience of functional impairments. Prospective research could clarify concerns about possible confounds that may occur in self-report measures as a function of declines in personal health and physical abilities and provide information about the presumed longitudinal influence of a resilient personality prototype on well-being among people who incur debilitating health problems.

Theoretically, the self-regulatory and goal-directed properties of a resilient prototype facilitate engagement in rewarding activities and desired pursuits under routine and stressful conditions. This increases the likelihood of positive emotions and reinforces a sense of self-efficacy and perceived control. This 'positive spiral' (Fredrickson, 2013) increases the probability that an individual will continue these activities, facilitating prosocial behaviours that can initiate and sustain interpersonal and social relationships and support systems. A previous longitudinal study found a resilient prototype was consistently associated with positive emotions over time, but this relationship did not contribute to the prediction of distress eight years later (Wright et al., 2023). However, the beneficial effects of this prototype on positive emotions, perceived control and social support may, in tandem, contribute to the prediction of well-being that have positive hedonic components, such as life satisfaction. They might also contribute to a more optimistic appraisal of one's personal health. Further, building upon the implications of previous research of persons with various chronic conditions, these relationships might exist regardless of functional impairments that accompany declining health.

We test these assumptions in the present study. We obtained data from a measure of the five factor personality traits administered at the first measurement occasion in the Midlife Development in the United States (MIDUS) project to replicate resilient and non-resilient protypes. Information was culled from individuals who reported no functional impairments at that time, and the characteristics that typify a resilient prototype (positive emotions, perceived control and social support) and indicators of well-being (life satisfaction, self-rated health) at the initial and the second measurement occasion (9–10 years

later) were also collected. Taking into account the degree of functional impairments based on the self-report measures at the second administration, we test the following hypotheses:

1. A resilient personality prototype will be associated with higher social support, greater perceived control and positive emotions at both measurement occasions.
2. A resilient personality prototype will operate through these mediators to predict higher life satisfaction and self-reported health at both measurement occasions.

We assume these effects will occur for women and men. The model in which we test these hypotheses is depicted in Figure 1.

METHODS

Participants

The study was conducted under the auspices of the Texas A&M University Institutional Review Board (IRB#: IRB2023-0814). Data were obtained from the Time I and Time II waves of the MIDUS project (http://midus.wisc.edu/). MIDUS is a longitudinal study of the psychological, social, physical and biological factors that influence health and well-being during aging (Radler, 2014). The publicly available data, managed by the University of Wisconsin-Madison, were first collected in 1995–1996 from consenting English-speaking adults in 48 contiguous states in the United States who were contacted using random-digit dialling. Participants completed a 30-min telephone interview and completed mail-in questionnaires, and a follow-up assessment was conducted approximately 10 years later (2004–2006).

Inclusion and exclusion criteria for the study and the resulting samples from both time points are depicted in Figure 2. Of the 7108 participants who participated at Time I, 2261 participants reported no functional limitations, indicating they were not disabled in routine activities of daily living, consistent with the International Classification of Functioning, Disability and Health from the World Health Organization (https://icd.who.int/dev11/l-icf/en). As depicted in Figure 2, 2132 participants (male, $n = 1147$, 53.8%; female, $n = 985$) of this subset met inclusion criteria for the self-report variables. There were 1243 individuals from the Time I subset (i.e., with no functional impairments) who participated at Time II. Of this number, 1212 participants (male, $n = 624$, 51.49%; female, $n = 588$) at Time II met criteria for the self-report measures. In the final sample retained for analysis, 640 reported no functional impairments and 572 reported some level of functional

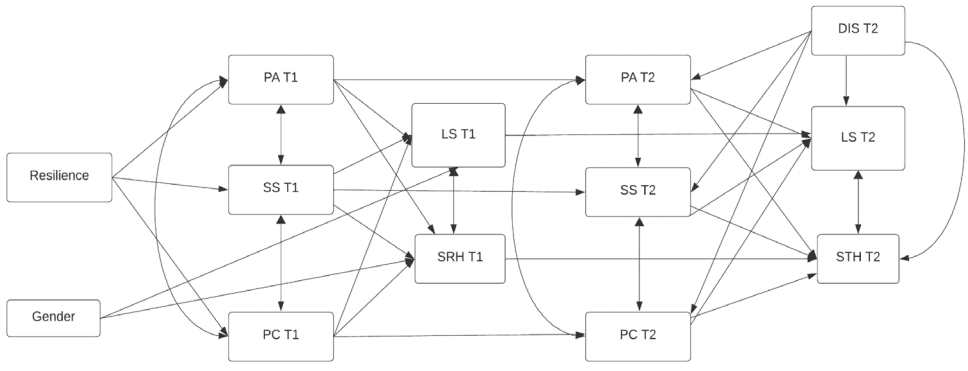

FIGURE 1 A priori theoretical model of resilient personality prototype, mediators and outcome variables. DIS, disability severity; LS, life satisfaction; PA, positive affect; PC, perceived control; Resilience, resilient personality prototype; SRH, self-rated health; SS, social support; T1, Time I; T2, Time II.

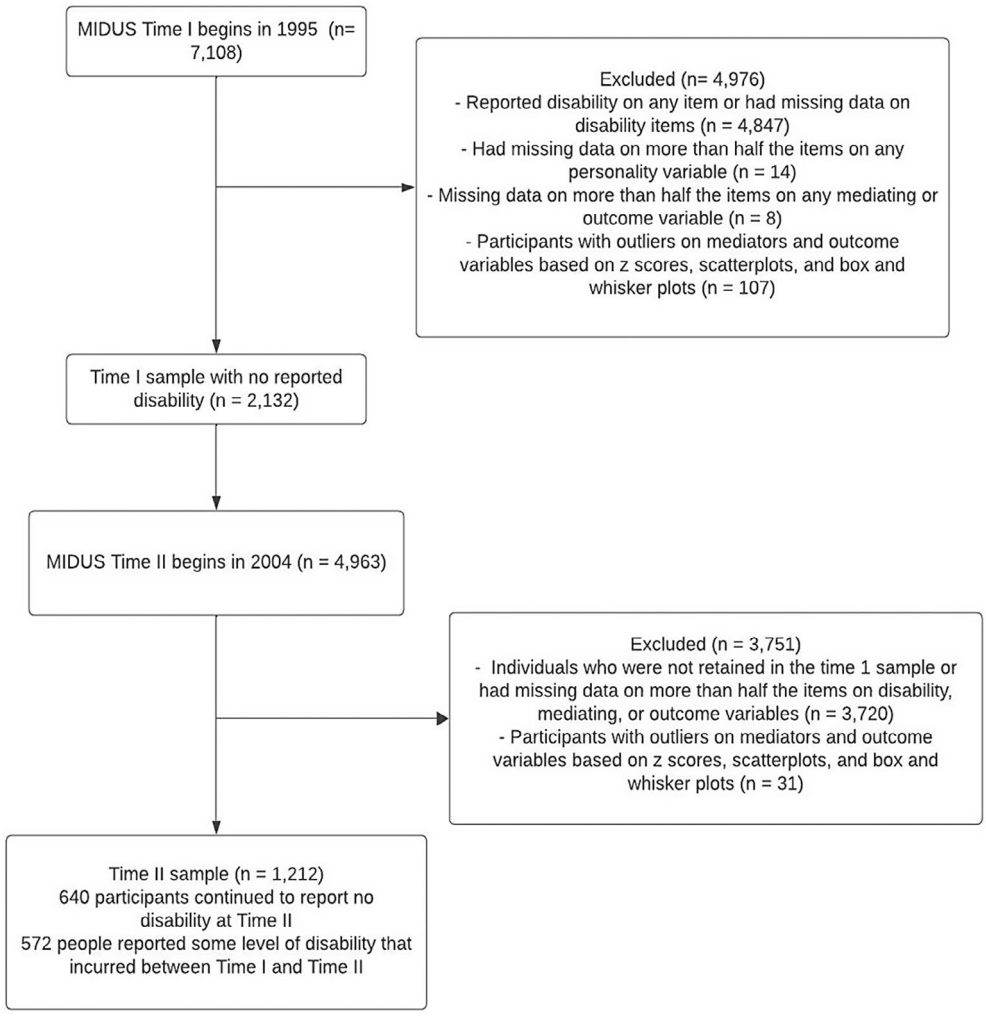

FIGURE 2 Strobe chart depicting inclusion and exclusion criteria of participants at MIDUS Time I and Time II.

impairment that occurred between the two measurement occasions. The mean age for the final sample was 51.67 years (SD = 10.88).

A series of group comparisons revealed the retained sample was significantly younger than those excluded from the study at both measurement occasions (p's < .05). A significantly higher percentage of women were excluded at both time points. Most participants at both time points identified as white (over 90%).

Predictor variables

Three independent variables were examined. Two served as predictor variables (gender, resilience). A third, self-reported level of disability, served as a covariate in the model.

Gender

This information was obtained at Time I (coded as male = 1, female = 2).

Resilience

The Big Five personality traits were assessed at Time I with a self-report questionnaire that contained 25 adjectives that are rated on a Likert-type scale (ranging from 1 = *A lot* to 4 = *Not at all*; Lachman & Weaver, 1997). Respondents rated how much they identified with each adjective. Four adjectives assess Neuroticism (moody, worrying, nervous, [not] calm), five measure Extraversion (outgoing, friendly, lively, active, talkative), seven measure Openness to Experience (creative, imaginative, intelligent, curious, broad-minded, sophisticated, adventurous), four assess Conscientiousness (organized, responsible, hardworking, [not] careless), and five measure Agreeableness (helpful, warm, caring, softhearted, sympathetic).

Negatively worded items were reverse coded to ensure that higher scores reflect a greater presence of that respective trait. Item responses were averaged to create a composite score for each subscale. The average scores for Neuroticism ($M = 2.14$; SD = .66; $a = .76$), Extraversion ($M = 3.29$; SD = .53; $a = .78$), Agreeableness ($M = 3.49$; SD = .48; $a = .81$), Openness to Experience ($M = 3.1$; SD = .5; $a = .77$) and Conscientiousness ($M = 3.49$; SD = .41; $a = .57$) were used to identify the personality prototypes at Time I.

Resilient and non-resilient personality prototypes were identified using cluster analysis of the five factor personality traits. Scale scores for each trait were used in a two-step cluster analysis process. First, hierarchical agglomerative cluster analyses were conducted using Euclidean distance and Ward's method, which identified three clusters in the data. The cluster centres identified from the hierarchical agglomerative analysis were then utilized in a subsequent *k*-means analysis to refine the cluster groups. This analysis was performed using Stata 17.0 (StataCorp, 2021). Figure 3 depicts the three clusters based on the standardized values. Consistent with previous research, a resilient cluster (41.14%; $n = 877$) was defined by low scores on Neuroticism ($M = -.71$) and high scores on Extraversion ($M = .58$), Agreeableness ($M = .56$), Conscientiousness ($M = .44$) and Openness to Experience ($M = .40$). One cluster defined by low Conscientious scores and very high Neuroticism scores approximated the profile of an 'undercontrolled' prototype (typically associated with externalizing behaviours; 29.46%, $n = 628$) and a third cluster defined by very low scores on Extraversion, Agreeableness, Conscientiousness and Openness to Experience resembled the profile of the 'overcontrolled' prototype (i.e., internalizing behaviours; 29.4%, $n = 627$).

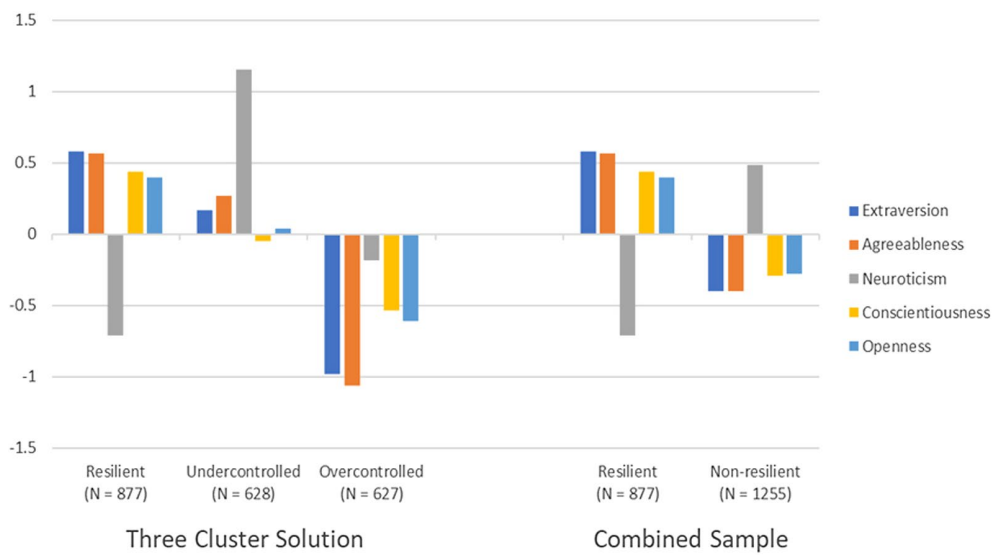

FIGURE 3 Resilient and non-resilient personality prototype clusters.

Our theoretical and clinical interests concern the expected differences between those who are resilient and those who are not, as conducted in previous work (e.g., Elliott et al., 2019, 2024). This maximizes our understanding of the positively valenced behaviours and resources unique to those with a resilient personality profile which, in turn, have clinical implications for understanding the issues encountered by those who do not have this profile. Following Wright et al. (2023), we combined the undercontrolled and overcontrolled prototypes to form a non-resilient prototype to test our hypotheses (58.86%; $n = 1255$; coded as '0'). As indicated in Figure 3, this group had higher levels of neuroticism and lower than average extraversion, agreeableness, conscientiousness and openness to experience. A parallel model was conducted using the three-cluster solution as predictor variables, and these results are available in the Data S1–S3 (along with accompanying analyses).

Disability

Disability severity is derived from participants' responses to the items measuring functional impairments in activities of daily living: '*How much does your health limit you in doing each of the following? Lifting or carrying groceries; Bathing or dressing yourself; Climbing several flights of stairs; Bending, kneeling, or stooping; Walking more than a mile; Walking several blocks; Walking one block; Vigorous activity (e.g., running, lifting heavy objects); Moderate activity (e.g., bowling, vacuuming)*' (Ware Jr & Sherbourne, 1992). Items are rated on a Likert-type scale (ranging from 1 = *A lot* to 4 = *Not at all*). Item responses were reverse coded and averaged so higher total scores reflect more functional impairments ($\alpha = .75$).

Scores at Time II were included in the analytic model (those who reported any functional impairment at Time I were excluded from the present study). Positive responses to this measure insinuate that the respondent incurred some degree of functional impairment in the years between Time I and Time II. Participants with missing data on less than half of the items were retained for analysis.

Mediating variables

Positive affect

The six-item Midlife Development Inventory (MIDI; Brim & Featherman, 1998) assessed positive affect. Respondents reflect on how they felt during the past 30 days and rate each item on a Likert-type scale (1 = *All of the time* to 5 = *None of the time*). Items include feeling 'cheerful', 'in good spirits', 'extremely happy', 'calm and peaceful', 'satisfied' and 'full of life'. Participants were removed if more than half of the items for this measure were missing at Time I. Participants with missing data on this variable were retained at Time II. Item responses were reverse coded and averaged to create a total score. Higher scores connote higher positive affect ($a's = .90, .89$, respectively).

Social support

Social support was measured with eight items: '*How much do your friends/family really care about you?' and 'How much can you rely on them for help if you have a serious problem*?' (Walen & Lachman, 2000). Participants rated each item on a 4-point Likert-type scale (1 = *A lot* to 4 = *Not at all*).

Participants were removed if more than half of the items for this measure were missing at Time I. Participants with missing data at Time II were retained. Item responses were averaged to create a composite total score. Negatively worded items were reverse coded to ensure that higher scores reflected greater social support (both $a's = .84$).

Perceived control

The Personal Mastery and Perceived Constraints scales (Lachman & Weaver, 1998) were used to measure a person's beliefs about the control they have in a given situation. The Personal Mastery scale has four items to which participants rate how much they agree or disagree ('*I can do just about anything I really set my mind to; When I really want to do something, I usually find a way to succeed at it; Whether or not I am able to get what I want is in my own hands; What happens to me in the future mostly depends on me*'). The Perceived Constraints scale has eight items to which participants rate how much they agree or disagree ('*There is little I can do to change the important things in my life; I often feel helpless in dealing with the problems of life; Other people determine most of what I can and cannot do; What happens in my life is often beyond my control; There are many things that interfere with what I want to do; I have little control over the things that happen to me; There is really no way I can solve the problems I have; I sometimes feel I am being pushed around in my life*'). Respondents rate each item on a Likert-type scale (1 = *Strongly agree* to −7 = *Strongly disagree*).

Participants with missing data on this variable were retained at Time II. Constraint items were reverse coded so that higher scores reflect a greater sense of control. Item responses were averaged to create a total score (*a's* = .82, .83, respectively).

Outcome variables

Two variables were indicators of well-being at Time I and at Time II: life satisfaction and self-rated health.

Life satisfaction

Life satisfaction was measured by five items that are rated on a Likert-type scale (0 = *the worst possible* to 10 = *the best possible*) regarding their satisfaction with finances, health, their relationship with their spouse/partner, their relationship with their children and overall life satisfaction (Prenda & Lachman, 2001). Participants were removed if more than half of the items for this measure were missing at Time I. Participants with missing data on this variable were retained at Time II. Answers were averaged to create the composite total score. Higher scores indicate higher life satisfaction.

Self-rated health

Self-rated health was measured by responses to the item, *'In general, would you say your physical health is excellent* (5), *very good* (4), *good* (3), *fair* (2) or *poor* (1)?'. Considerable evidence supports using a single item as an indicator of personal health (Benyamini, 2016). Participants with missing data on this variable were retained at Time II. Higher scores indicate a more positive assessment of one's personal health status.

Data analysis

Means, standard deviations, ranges and correlations were calculated for all variables (see Tables 1 and 2). Descriptive statistics examined potential differences between personality prototypes and gender on the model variables. Structural equation modelling using MPlus Version 8.1 was conducted to test these direct and indirect effects between the resilient prototype in predicting well-being through the mediating variables (see Figure 1). Full information maximum likelihood estimation was used to handle missing data. Model fit was evaluated with conventional standards of global

TABLE 1 Means and standard deviations for self-report variables by personality prototypes and gender.

	Personality prototype					Gender				
	Resilient		Non-resilient			Men		Women		
	(Time 1 $n=877$; Time 2 $n=499$)		(Time 1 $n=1255$; Time 2 $n=713$)			(Time 1 $n=1147$; Time 2 $n=624$)		(Time 1 $n=985$; Time 2 $n=588$)		
Variables	***M***	**SD**	***M***	**SD**	***p*-value**	***M***	**SD**	***M***	**SD**	***p*-value**
Perceived control										
Time 1	6.199	.676	5.617	.860	<.001	5.893	.807	5.814	.877	.032
Time 2	6.155	.721	5.705	.808	<.001	5.958	.739	5.818	.864	.002
Positive affect										
Time 1	3.887	.522	3.372	.646	<.001	3.596	.634	3.571	.667	.377
Time 2	3.845	.532	3.473	.587	<.001	3.645	.576	3.607	.613	.267
Social support										
Time 1	3.552	.421	3.290	.486	<.001	3.306	.486	3.504	.446	<.001
Time 2	3.603	.401	3.440	.425	<.001	3.431	.421	3.588	.411	<.001
Disability severity										
Time 2	1.141	.238	1.157	.241	.253	1.140	.221	1.161	.258	.130
Self-rated health										
Time 1	4.161	.795	3.927	.796	<.001	4.031	.790	4.015	.819	.662
Time 2	4.168	.762	3.986	.796	<.001	4.051	.773	4.071	.804	.657
Life satisfaction										
Time 1	8.508	.895	7.879	1.048	<.001	8.091	.999	8.193	1.074	.024
Time 2	8.505	.843	8.067	.902	<.001	8.214	.878	8.281	.930	.201

Note: Mean score differences were examined by independent sample t-tests.

fit evaluation (root-mean-square error of approximation [RMSEA] ≤ .06, standardized root-mean-square residual [SRMR] ≤ .08, comparative fit index [CFI] and the Tucker-Lewis Index [TLI] ≥ .95; Hu & Bentler, 1999; Kline, 2016).

RESULTS

There were significantly more men than women in the non-resilient group (male, $n=700$, 55.78%; female, $n=555$; 44.22%) compared to the resilient group (male, $n=447$, 50.97%; female, $n=430$; 49.03%, $p=.03$). The resilient group was significantly older ($M=43.21$ years, SD = 11.51; range 25–74 years) than the non-resilient group at Time I ($M=40.97$ years, SD = 10.84; ranged 24–74 years; $p<.001$).

Individuals with a resilient personality prototype reported higher social support, positive affect, perceived control, life satisfaction and self-rated health at both measurement occasions than the non-resilient group (see Table 1). The two prototype groups did not differ in disability severity. At both Time I and Time II men had significantly higher scores on perceived control than women, and women had significantly higher scores on social support. At Time I, women reported higher life satisfaction than men, but these differences were not observed nine to 10 years later.

Personality prototype was significantly correlated with all the model variables except disability severity at Time II (see Table 2). Disability severity at Time II was significantly and inversely correlated

TABLE 2 Means, SD and correlations for model variables.

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Resilience	–											
2. SS T1	.28**	–										
3. PC T1	.36**	.23**	–									
4. PA T1	.41**	.25**	.46**	–								
5. SRH T1	.15**	.14**	.17**	.21**	–							
6. LS T1	.31**	.33**	.32**	.51**	.29**	–						
7. DIS	−.04	.03	−.10**	−.05	−.10**	.00	–					
8. SS T2	.18**	.50**	.17**	.15**	.09**	.17**	−.04	–				
9. PC T2	.27**	.16**	.53**	.28**	.13**	.19**	−.10**	.23**	–			
10. PA T2	.31**	.16**	.24**	.50**	.15**	.32**	−.07*	.19**	.40**	–		
11. SRH T2	.12**	.12**	.11**	.11**	.44**	.18**	−.28**	.09**	.10**	.14**	–	
12. LS T2	.24**	.21**	.17**	.31**	.22**	.49**	−.06*	.26**	.34**	.45**	.24**	–
n	2132	2132	2132	2132	2132	2132	1212	1212	1212	1212	1212	1212
M	–	3.4	5.86	3.58	4.02	8.14	1.15	3.51	5.89	3.63	4.06	8.25
SD	–	.48	.84	.65	.8	1.04	.24	.42	.8	.59	.79	.9
Range	0–1	1.88–4	3.17–7	1.5–5	2–5	4.75–10	1–2.2	2.25–4	3.42–7	1.83–5	2–5	5.4–10

Abbreviations: DIS, disability severity; LS, life satisfaction; PA, positive affect; PC, perceived control; Resilience, Resilient Prototype = 1, Non-Resilient Prototype = 0; SRH, self-rated health; SS, social support; T1, Time I; T2, Time II.

*$p < .05$. **$p < .01$.

with perceived control ($r = -.10$), positive affect ($r = -.07$), self-rated health ($r = -.28$) and life satisfaction ($r = -.06$) at Time II.

Longitudinal structural equation model

The a priori model ($\chi^2[40] = 231.063$, $p < .001$) produced a comparative fit index (CFI) of .95, a root-mean-square error of approximation (RMSEA) of .063, and a Tucker-Lewis index (TLI) of .9, indicating good model fit (Figure 4 depicts the significant paths). Gender did not significantly contribute to the model; therefore, it is not included in Figure 4. The unstandardized and standardized path coefficients of the final model using maximum likelihood estimation with 2000 bootstrap replications are presented in Table 3.

The significant paths displayed in Figure 4 are consistent with our theoretical expectations, demonstrating the positive effects of resilience to the mediating variables, and from the mediating variables to the outcome variables. Disability severity was not significantly associated with positive affect or life satisfaction at that measurement occasion, contrary to our expectations. The final model explained 56% of the variance of self-rated health and 65% of the variance of life satisfaction at Time I and 46% of the variance of self-rated health and 51% of the variance of life satisfaction at Time II.

Indirect effects

Mediation effects were tested using bias-corrected bootstrap confidence intervals with 2000 bootstrap replications. Statistically significant unstandardized indirect coefficients are presented in the Table S4. Resilience had indirect and positive effects through social support, positive affect and perceived control on life satisfaction at Time I. Resilience also had indirect and positive effects through social support and positive affect at Time I and through self-rated health at Time I to predict higher self-rated health at Time II. Resilience had indirect and positive effects through the mediators at Time I and through life satisfaction at Time I to life satisfaction at Time II. The beneficial effects of resilience on positive affect, perceived control and social support at both measurement occasions predicted higher life satisfaction at Time II.

In sum, a resilient personality prototype operated through higher social support and positive affect to predict higher self-rated health at Time I and Time II, and it operated through all three mediators to predict higher life satisfaction at both measurement occasions. The beneficial effects exerted by a resilient

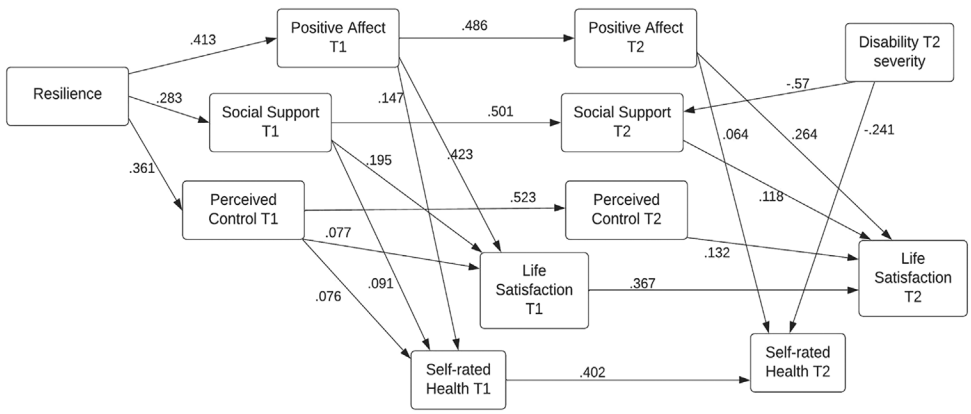

FIGURE 4 Final model of personality prototypes, mediators and well-being with standardized path coefficients. Only significant paths are shown (all p's < .05). Gender did not significantly contribute to the model and it is not depicted.

TABLE 3 Path coefficients of the final model predicting self-rated health and life satisfaction using maximum likelihood estimation with 2000 bootstrap replications.

Dependent variable	Independent variable	Unstandardized estimate	Standard error (unstandardized)	Standardize estimate	Standard error (standardized)
SST1	Resilience	.258**	.025	.283**	.025
PCT1	Resilience	.587**	.039	.361**	.021
PAT1	Resilience	.534**	.033	.413**	.020
SRHT1	SST1	.157**	.052	.091**	.030
	PCT1	.074*	.032	.076*	.033
	PAT1	.177**	.043	.147**	.036
	Gender	−.064	.043	−.041	.028
LST1	SST1	.419**	.062	.195**	.028
	PCT1	.093**	.035	.077**	.029
	PAT1	.640**	.044	.423**	.029
	Gender	.062	.046	.032	.024
SST2	SST1	.472**	.028	.501**	.024
	DIST2	−.101*	.048	−.057*	.027
PCT2	PCT1	.520**	.025	.523**	.022
	DIST2	−.177*	.086	−.053	.026
PAT2	PAT1	.450**	.025	.486**	.024
	DIST2	−.118	.065	−.048	.026
SRHT2	SST2	.066	.048	.036	.026
	PCT2	−.010	.026	−.010	.026
	PAT2	.084*	.038	.064*	.028
	DIST2	−.781**	.108	−.241**	.028
	SRHT1	.405**	.027	.402**	.024
LST2	SST2	.248**	.052	.118**	.025
	PCT2	.147**	.029	.132**	.026
	PAT2	.398**	.040	.264**	.026
	DIST2	−.101	.085	−.027	.023
	LST1	.338**	.024	.367**	.025

Note: Resilience: Resilient = 1, Non-Resilient = 0.

Abbreviations: DIS, disability severity; LS, life satisfaction; PA, positive affect; PC, perceived control; Resilience, resilience personality prototype; SRH, self-rated health; SS, social support; T1, Time I; T2, Time II.

*$p < .05$. **$p < .01$.

personality prototype occurred regardless of the negative associations of disability severity on self-rated health and its deleterious indirect effects through perceived control and social support onto life satisfaction.

DISCUSSION

Consistent with our understanding of the Block model of ego control and resiliency, and its recent applications in clinical studies, a resilient personality prototype prospectively predicted two indicators of well-being assessed nine to 10 years later through its salubrious effects on social support, positive affect and perceived control. These beneficial effects occurred regardless of functional impairments reported at the second assessment. This pattern provides further evidence of the behavioural and emotional self-regulatory and prosocial attributes and the proclivity for positive emotional experiences that typify

a resilient prototype, demonstrating its significant influence over time. Although these patterns have been observed among children, adolescents and young adults, this study is among the first to report these relationships among adults in midlife and in the context of acquired debilitating impairments.

In the resilience literature, personality traits have been dismissed for having small and indirect effects on adjustment following potentially stressful events, and there are no 'key' traits that accurately identify who will and will not be resilient (Bonanno & Westphal, 2024). Such criticisms have bleak implications for clinical practice. However, the present study builds upon previous work to demonstrate the utility of a person-centred approach to studying the organization and interplay of non-pathological personality traits, and how they predict specific behaviours that facilitate well-being. This approach makes a persuasive case for appreciating the importance of significant indirect effects. Theoretically and statistically, indirect effects (i.e., mediation) can reveal the 'mechanisms that drive the relationship' (Hoyt et al., 2008; p. 325) between a predictor variable (e.g., a resilient prototype) and an important clinical outcome (e.g., life satisfaction, self-rated health). The significant indirect effects in the present study identify ways in which a resilient prototype can facilitate well-being over a considerable time period. The results imply contextual models sensitive to co-occurring relationships between predictor, mediating and outcome variables are well-suited for examining the theoretical properties of a resilient personality prototype.

The consistent, significant relationships between social support, perceived control and positive affect warrant further discussion. In addition to its self-regulatory properties, perceived control has motivational qualities that facilitate goal-oriented behaviours often accompanied by positive emotions (Villarreal & Heckhausen, 2017). Positive emotions and goal-directed behaviour can offset the distressing impacts of persistent pain and other bothersome symptoms associated with chronic health conditions (Ong et al., 2010). Our findings also provide an alternative perspective on previous work that found Agreeableness predicting life satisfaction following disability (Boyce & Wood, 2011). Its prosocial qualities, accompanied by behavioural self-regulation and a proclivity for positive affect that characterize a resilient profile, suggest recursive relationships in which a resilient individual maintains rewarding interpersonal support systems in part by regulating their expression of negative emotions, and engaging in activities that foster positive emotional experiences. In contrast, non-resilient individuals lack these characteristics which, then, undermine their quality of life and well-being over time, independent of declines in functional abilities.

It is sometimes difficult to translate information from the positive psychology literature and resilience research, specifically, into clinical practice (Johnson & Wood, 2017). This applies to clinical assessment practices: Despite their long history in personality research, the five factor traits are not routinely included in clinical evaluations. None of the three editions of a handbook on positive psychology (beginning with Snyder & Lopez, 2002) dedicated a chapter to these traits, nor were they discussed as viable constructs for positive psychology research and practice. Yet they are listed in the World Health Organization's International Classification of Functioning, Disability and Health (WHO-ICF) as personal features clinicians could assess to determine a patient's unique strengths and vulnerabilities (under 'b126 Temperament and Personality Factors'; https://apps.who.int/classifications/icfbrowser/). Perhaps the theoretical model that guided the present study may prompt clinicians to reconsider their value in clinical practice, particularly in scenarios in which psychopathological tendencies are less likely to be a concern.

Our findings reinforce the importance of evidence-based interventions for individuals who are at risk for lower well-being in midlife, including cognitive-behavioural approaches that promote self-regulation, flexible coping repertoires and social engagement (Maddux & Kleiman, 2021; Nezu & Nezu, 2021). Perceived control (née self-efficacy) is a centrepiece of the empirically supported Health Action Process Approach (HAPA; Schwarzer et al., 2011) as an intervention for individuals with chronic health conditions.

Limitations

Structural equation modelling is an explicitly causal approach, well-suited for testing the theorized effects we anticipated from a resilient personality prototype through the mediating variables to the outcomes of interest in our study (Vowels, 2023). In our report, we tried to use terminology consistent with this approach and our theoretical assumptions (Grosz et al., 2020). The shortcomings and limitations of our approach compel us to consider other variables absent from our model that could account, in part, for our results (Grosz et al., 2020; Vowels, 2023). Examining our model with a directed acyclic graph (DAG) – a recommended method to critique a priori assumptions about causal relationships variables (Rohrer, 2018) – we can identify several confounding variables that have 'backdoor paths' to all of the variables we studied including genetic predispositions, socio-economic background, education and racial/ethnic identity (the MIDUS project lacks diversity on the latter three variables). 'Collider' variables can adversely affect paths in a model, including factors such as nonresponse bias and attrition bias (Rohrer, 2018). Both are present in the present analysis, and we cannot dismiss the possible effects they may have on our findings. Further, there are mediating effects that we did not consider in our work. We do not know the degree to which any changes in personality traits may have occurred and if these changes influenced our results (Bleidorn et al., 2022). We did not consider any effects that might be attributable to the specific nature and number of chronic health conditions. Although our report is part of a programmatic series of studies of the resilient prototype, many of the limitations we mention cannot be resolved through replication studies that utilize similar methodologies (Vowels, 2023).

CONCLUSION

The present study extends a systematic program of research documenting the ways in which a resilient prototype facilitates positive adjustment, and how the behavioural deficits and difficulties might contribute to the distress experienced by persons with a non-resilient profile in routine and stressful conditions. Hopefully, this work demonstrates the potential clinical utility of the Block model of resilience in understanding the ways in which the non-pathological five factor traits relate to elements of well-being and quality of life among adults who incur functional impairments (Joseph & Wood, 2010).

AUTHOR CONTRIBUTIONS

Mikaela Spooner: Conceptualization; methodology; data curation; investigation; formal analysis; writing – original draft; writing – review and editing; visualization. **Timothy R. Elliott:** Conceptualization; methodology; investigation; supervision; formal analysis; project administration; writing – original draft; writing – review and editing. **Wen Luo:** Methodology; formal analysis; supervision; writing – original draft; writing – review and editing. **Kelly M. Lee:** Supervision; writing – review and editing; conceptualization. **Meredith L. C. Williamson:** Conceptualization; supervision; writing – original draft; writing – review and editing.

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CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to disclose.

DATA AVAILABILITY STATEMENT

Data extracted from the publicly available Midlife in the United States (MIDUS) project for this study are available upon request to the corresponding author. Publicly available data from the Midlife in the United States project were used for this research. Since 1995 the MIDUS study has been funded by the following: John D. and Catherine T. MacArthur Foundation Research Network, the National Institute on Aging (P01-AG020166) and the National institute on Aging (U19-AG051426). Further information may be found at the project website, https://midus.wisc.edu/.

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