**Understanding Resilience in Emerging Adults: An International, Multi-Site Study**

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**Abstract**

Emerging adulthood is characterized by marked increases in vulnerability to psychiatric illness. As such, understanding how risk and protective factors function to promote, or impede, resilience during early adulthood is critical. This pre-registered work is the first to test four extant models of resilience among emerging adults. 1,075 participants drawn from four international university sites were followed across two stressors: the transition to university and the COVID-19 pandemic. We found support for the compensatory model, which holds that risk and protective factors contribute additively to predict resilience across timepoints. Findings also support the risk-protective model, which posits that protective factors interact with risk factors in a buffering effect to reduce negative outcomes, during the university transition. Results have the potential to guide theory development by highlighting the dynamic nature of resilience and have implications for prevention and intervention efforts by underscoring the powerful influence of protective factors, regardless of risk.

*Keywords*: Longitudinal methods; risk factors; well-being; stress; adult development.

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Emerging adulthood is a developmental period involving a series of ubiquitous and normative challenges that increase individuals’ vulnerability to psychiatric disorders (Arnett, 2007; Arnett, 2014). Indeed, rates of psychiatric disorders increase substantially during emerging adulthood, which spans the ages of 18 to 25 years (Auerbach et al., 2016; Kessler et al., 2007). Yet, many individuals do not develop psychopathology during this period and instead demonstrate resilience (i.e., an ability to adapt successfully to challenging circumstances; Luthar, 2006; Masten et al., 1990). Key to understanding and ultimately promoting resilience includes elucidating the ways in which risk and protective factors influence resilience among emerging adults.

**Resilience during Emerging Adulthood**

Resilience has been studied widely, and there has been considerable progress in understanding how best to operationalize the construct. Although resilience historically has been conceptualized as a static trait, there is a burgeoning understanding of resilience as a dynamic and multi-faceted process that can be promoted or impeded across time (Flynn et al., 2021; Kuldas & Foody, 2021; Masten et al., 2021). Further, in the same way that defining health should not capture solely the absence of disease, there is a growing consensus that assessments of resilience ought to include aspects of healthy psychological functioning, such as subjective happiness and well-being (Almedom & Glandon, 2007; Bonanno et al., 2004; Luthar, 2006; Masten et al., 1990; Southwick et al., 2014; Troy et al., 2023). As such, resilience can be conceptualized as a multi-factorial outcome that involves well-being, subjective happiness, and the absence of psychopathology (e.g., Bonanno, 2004; Seery, 2011; Southwick et al., 2014; Troy et al., 2023).

Critical life transitions offer an ideal and naturalistic window to investigate resilience in the real world, given that the need for adaptation is inherent in them. Emerging adulthood is particularly rich in developmental life transitions. As such, investigations during this period provide an opportunity to understand factors that promote or impede resilience during life transitions (Masten, 2004). One common and often challenging transition during emerging adulthood is the transition to university wherein many students experience academic, social, and financial challenges (Bayram & Bilgel, 2008; Brett et al., 2022; Rahat & Ilhan, 2016). Indeed, the university transition is a time when psychological distress markedly increases, and both risk (e.g., perceived stress) and protective factors (e.g., social support) can influence resilience (Brett, et al., 2022; Rahat & Ilhan, 2016; Howell & Miller-Graff, 2014; Leary & DeRosier, 2012). Critically, students who transitioned to university during the 2019/2020 academic school year faced an additional challenge: the COVID-19 pandemic, starting in March 2020 (Gruber et al., 2021). The pandemic necessitated extensive measures including sheltering in place, social isolation, and a sudden transition to online learning for students worldwide. Many also experienced a loss of income, health-related worries, and even the loss of loved ones (Browning et al., 2021; Cao et al., 2020). In line with life-course theory, which emphasizes the importance of the timing and context of major life events (Clausen, 1986; Elder, 1985), the successive nature of these stressors may have exacerbated existing adaptational difficulties. Given the potential for pathways of well-being to become established during emerging adulthood (Masten et al., 2006), we must understand the processes through which risk and protective factors promote or impede resilience during this developmental period.

How can we understand differing trajectories of adaptation to challenges in emerging adulthood? Four leading models of resilience exist in the current literature, each of which posits different explanations for the relations between risk and protective factors in predicting resilience amidst adversity (see **Figure 1**; Masten & Coatsworth, 1998; Rutter, 1987).

**Figure 1**

*Visual Depiction and Description of Models of Resilience*



The first of these models is the *compensatory model*, which suggests that risk and protective factors have additive and independent effects on adjustment, with risk factors decreasing resilience and protective factors increasing resilience (Garmezy et al., 1984; Rutter, 1985). The second model is the *risk–protective model*, which suggests that resilience is related to the interaction effect between risk and protective factors such that, relative to low levels of protective factors, higher levels will have greater buffering effects on the relation between risk factors and resilience (Dubow & Luster, 1990; Garmezy et al., 1984). The third model is the *challenge model*, which suggests a curvilinear relation wherein a moderate amount of risk enhances resilience by activating protective factors, which subsequently blunt the potential impact of risk factors(Garmezy et al., 1984; Wolin & Wolin, 1995; Zimmerman & Arunkumar, 1994). The fourth model is the *protective–protective model*, which suggests that resilience is related to the interaction between the number of risk and protective factors, such that the impact of risk factors on resilience will decrease as the number of protective factors increases (Garmezy et al., 1984; Hollister-Wagner et al., 2001).

Several recent studies have tested which model(s) best predict resilience among emerging adults (Goldstein et al., 2013; Heinze et al., 2020; Oginni et al., 2020). This preliminary work has broadly indicated support for the compensatory model, while the risk-protective model has received mixed support. However, this work has examined resilience in unique contexts, such as the transition out of child welfare (Goldstein et al., 2013) and discrimination among LGBTQIA+ emerging adults in Nigeria (Oginni et al., 2020). Beyond the emerging adulthood period, there has been some work in support of the compensatory and risk-protective models among both children and adults (Anyan & Hjemdal, 2016; Askeland et al., 2020; Evans et al., 2010; Hjemdal et al., 2007; Hurd et al., 2009). For instance, the compensatory and risk-protective models have been supported in the context of risk for adolescent substance use (Ostaszewski & Zimmerman, 2006; Pisarska et al., 2016) and among rural male farmers (McLaren & Challis, 2009). Further, although the protective-protective and challenge models have garnered mixed support in both the child and adult literature to date (Christiansen & Evans, 2005; Erdem & Slesnick, 2010; Evans et al., 2010; Gomez & McLaren, 2006; Hollister-Wagner et al., 2001; McLaren & Challis, 2009), they have yet to be tested in emerging adulthood. As such, longitudinal research is lacking that tests all four models simultaneously during emerging adulthood.

**The Present Investigation**

The present study fills these gaps and extends previous work by testing four proposed models of resilience among emerging adults across two ubiquitous, naturalistic, and successive stressors: the transition to university and the COVID-19 pandemic, which exacerbated mental health concerns among emerging adults (Gruber et al., 2023). Taking an ecological system theory approach (e.g., Bronfenbrenner, 1979), we will examine risk and protective factors across domains of functioning. In line with previous work, we will examine factors across the *individual*, *school*, *family/community*, and *peer/social* domains (Evans et al., 2010). Specifically, for each domain, we developed empirically derived indices of risk and protective factors to test the four resilience models and to identify which model(s) explain levels of resilience across time. To further extend the current literature, which has often neglected the role of demographic factors, we will consider the role of gender, age, and ethnicity as potential covariates in each of the four models of resilience.

Within the emerging adult literature, several key risk and protective factors have emerged as being relevant to resilience. For each domain of functioning, we identify one risk and one protective factor that has received particularly promising empirical support. Within the individual domain, high perceived stress is a well-documented risk factor capturing cognitively mediated appraisals of general stress (Cohen et al., 1983). High perceived stress has been linked to poor social and emotional well-being (Anastasiades et al., 2017; Xia & Ma, 2020). In contrast, reward responsiveness has been identified as a critical protective factor associated with adaptive functioning among emerging adults (Corral-Frias et al., 2016; Taubitz et al., 2015). Within the school domain, first-generation student status is an established risk factor for increased mental health difficulties (House et al., 2020; Jenkins et al., 2013), whereas high academic self-efficacy is linked with greater well-being and better adjustment in university students (Chemers et al., 2001; Grøtan et al., 2019). With regard to family/community factors, a family history of mental illness has been robustly linked with psychopathology among emerging adults and university students (Ensminger et al., 2003; Mitchell & Abraham et al., 2018). In contrast, within the family/community domain, feelings of belongingness at university are a protective factor against psychopathology and are associated with greater well-being (Gopalan et al., 2021; Suhlmann et al., 2018). Finally, within the peer/social domain, the emerging adult literature highlights risk preference as a particularly important risk factor associated with decreased resilience (Gros et al., 2010). Presence of this risk factor is often indexed by interpersonal aggressive and illegal behaviours (Modecki, 2016). Conversely, social support is a well-recognized protective factor associated with increased resilience among emerging adult populations (Taylor et al., 2014).

We assessed each of these risk and protective factors during students’ first six months at their respective university (sampled across four sites spanning Europe and North America to enhance generalizability) and then followed them across their first year of university. In line with current conceptualizations, resilience was operationalized as a latent factor composed of well-being, subjective happiness, and the absence of psychopathology (Bonanno, 2004). Based on previous work and in line with the compensatory model, there is reason to expect that both risk and protective factors will have direct and independent roles in predicting resilience over time. In addition, there is reason to believe that an interactive association between risk and protective factors will emerge, though there is insufficient empirical evidence within emerging adults to hypothesize whether this association will be buffering (i.e., risk-protective model), curvilinear (i.e., challenge model), or additive (i.e., protective-protective model) in nature. In other words, while we anticipate that risk and protective factors will interact to influence resilience, we do not yet have enough information to predict the nature of that interaction in emerging adults.

**Transparency and Openness**

This work was pre-registered (see <https://aspredicted.org/ZWC_4XW>). Data and analytic code are available at <https://osf.io/j4uh5/?view_only=8f629b0d2683450cb73c3c89fb0fc490>, while readers are encouraged to see **online supplement** for details related to the broader multi-site project from which the data stem. We report how we determined our sample size, all data exclusions, all manipulations, and all measures in the study. Data collection at each site was approved by relevant institutional review boards, and study protocols were carried out in accordance with the World Medical Association Declaration of Helsinki.

**Methods**

**Participants**

Participants were drawn from four geographically diverse sites across Europe and North America: the University of Colorado, Boulder (*n* = 658), the University of British Columbia (*n* = 211), University College London (*n* = 139), and Temple University (*n* = 67). This sample, which was drawn from a larger multi-site project, represents a subsample of participants who completed the measures of interest which were only administered at these four study sites. An initial project stemming from this broader multi-site project can be accessed at <https://osf.io/8ub37/> (see **online supplement** for additional details; also see <https://psyarxiv.com/gt4xk/> for other manuscripts stemming from this broader dataset). Given that we aimed to examine resilience in the context of emerging adulthood, first-year university students between 18 to 25 years of age were eligible to participate in the present study.

 A total of *N* = 1,075 participants were included in the present study. The sample had a mean age of 18.35 (*SD* = 0.61; range = 18 to 23) years. The majority of participants identified as women (76%), followed by men (23%), and transgender or non-binary (0.5%). With regard to racial identity, the majority of participants identified as White (56%; *n* = 600) or Asian (26%; *n* = 281), followed by Latinx/e-White (4%; *n* = 41), Latinx/e (3.7%; *n* = 40), Asian-White (3.1%; *n* = 34), and Black (1.9%; *n* = 21). See **online** **supplement** for further details.

**Measures**

 **Resilience Factors.** Following recommendations put forth by Bonanno (2004) and others (e.g., Seery, 2011; Southwick et al., 2014), resilience was conceptualized as a latent variable composed of three measures including: life satisfaction, subjective happiness, and the absence of psychopathology. Descriptive statistics for these scales are presented in **Table 1**.

The Satisfaction with Life Scale (SWLS; Diener et al., 1985) was used to index life satisfaction. The SWLS is a 5-item self-report scale assessing a general sense of life satisfaction. The SWLS is a well-validated measure with strong demonstrated reliability in the current sample (*αs* = .87-.88; Pavot & Diener, 1993, 2008). Participants responded to items using a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), and items were then summed. Higher scores on the SWLS indicate higher levels of life satisfaction.

The Subjective Happiness Scale (SHS; Lyubomirsky & Lepper, 1999) was used to index global subjective happiness. The SHS has good psychometric properties, with strong reliability in the current sample (*αs* = .88-.90; Lyubontera & Lepper, 1999). Participants respond to items on the SHS using a 7-point scale, with response options varying by item. The negatively worded item was reverse-scored, and all items were summed. Higher scores on the SHS indicate higher levels of subjective happiness.

The DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure (DSM-5 CC; American Psychiatric Association, 2013) was used to index the absence of psychopathology symptoms. The DSM-5 CC is a 23-item self-report measure of general psychiatric symptoms (Narrow et al., 2013) across the following domains: depression, anger, mania, anxiety, somatic symptoms, suicidal ideation, psychosis, sleep problems, memory, repetitive thoughts and behaviors, dissociation, personality functioning, and substance use. Individuals reported how often they have been bothered by each item over the previous two weeks on a 0 (*none at all*) to 7 (*nearly every day*) scale. The DSM-5 CC has demonstrated strong reliability in the literature and in the current study (*αs* = .89-.90; Clarke & Kuhl, 2014; Narrow et al., 2013). Given that we used the DSM-5 CC to index the absence of psychopathology, each of the 23 individual items were reverse-scored such that higher scores reflected lower levels of psychopathology symptoms. Next, in line with previous work (e.g., Bastiaens & Galus, 2018; Harvey et al., 2021), reverse-scored items were summed to develop a total score. In the present study, higher scores on the DSM-5 CC indicate the presence of less psychopathology.

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| **Table 1.** Descriptive Statistics for Resilience Indicators. |
|  | **Transition to University** | **COVID-19** |
| **Satisfaction with Life (SWLS),** *M (SD)* | 4.57 (1.33) | 4.48 (1.38) |
| **Subjective Happiness (SHS),** *M (SD)* | 18.12 (5.16) | 17.99 (5.45) |
| **Psychopathology (DSM-5 CC),** *M (SD)* | 20.23 (13.64) | 18.55 (12.88) |
| *Note.* SWLS = Satisfaction with Life Scale; SHS = Subjective Happiness Scale; DSM-5 CC = DSM-5 Self-Rated Level 1 Cross-Cutting Symptom Measure. Descriptive statistics are presented for the DSM-5 CC prior to reverse scoring, such that higher values indicate higher levels of psychopathology.  |

**Risk Factors.** Consistent with prior work, a cumulative risk index was created by calculating the number of ecological domains in which an individual had a risk factor. Drawing from prior research focused on risk factors in emerging adulthood, we assessed perceived stress (individual domain; Perceived Stress Scale [Anderson, Monroy, & Keltner, 2018; Cohen et al., 1983]), first-generation student status (school domain; single-item generated in-house), family history of mental illness (family/community domain; Family Index of Risk for Mood [Algorta et al., 2013]), and recent aggressive and/or illegal behaviour (peer/social domain; aggressive and illegal behaviour subscale of the Cognitive Appraisal of Risky Events scale [Fromme et al., 1997]). Consistent with previous work both in the fields of resilience (e.g., Barlett & Barlett, 2016; Evans et al., 2010; Hollister-Wagner et al., 2001; Seifer et al., 1996) and allostatic load theory (Liu et al., 2021; Juster et al., 2010, 2016), individuals were assigned a score of 1 when the relevant risk factor was present, if they responded affirmatively to a dichotomous item, or if they scored in the most extreme quartile on a continuous scale (at or above the 75th percentile). Scores then were tallied such that each individual received a cumulative risk index value ranging from 0 (no risk factors) to 4 (risk factors present across all four domains). Descriptors of risk variables are presented in **Table 2**.

**Protective Factors.** The cumulative protection index was created by calculating the number of ecological domains in which an individual had a protective factor. Protective factors were empirically derived from previous work examining risk and protective factors in emerging adulthood and included responsiveness to reward (individual domain; reward responsiveness subscale of the Behavioural Approach System Scale [Carver & White, 1994]), academic self-efficacy (school domain; Academic Self-Efficacy Scale [Gaumer Erickson et al., 2018]), belongingness at university (family/community domain; Belonging Uncertainty Scale [Walton & Cohen, 2007], reverse coded such that a higher score indicates a greater sense of belongingness at an individual’s university), and social support (peer/social domain; Perceived Social Support Scale [MIDUS II]). In line with previous work (Barlett & Barlett, 2016; Evans et al., 2010; Hollister-Wagner et al., 2001; Liu et al., 2021; Juster et al., 2010, 2016; Seifer et al., 1996), individuals were assigned a score of 1 when the relevant protective factor was present, if they responded affirmatively to a dichotomous item, or if they scored in the most extreme quartile on a continuous scale. These scores were then summed such that each individual was assigned a cumulative protective index value ranging from 0 (no protective factors) to 4 (protective factors present within each domain). Descriptors of protective variables are presented in **Table 2**.

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| **Table 2.** Descriptors of Protective and Risk Variables. |  |
| **Variable** | **Domain** | **Criterion** |  |
| *Risk Variables* | **% At-Risk** |
| Perceived stress | Individual | ≥75th percentile | 28.8 |
| First-generation student status | School | Yes | 19.1 |
| Family history of mental illness | Family/Community | Yes | 61.3 |
| Risk preference | Peer/Social | ≥75th percentile | 35.6 |
| *Protective Variables* | **% Protected** |
| Responsiveness to reward | Individual | ≥75th percentile | 28.6 |
| Academic self-efficacy | School | ≥75th percentile | 27.4 |
| Belongingness at university | Family/Community | ≥75th percentile | 26.1 |
| Social support | Peer/Social | ≥75th percentile | 44.7 |

**Procedure**

 A pre-COVID baseline assessment was collected during the Fall of 2019, when participants were in their first semester of university. Baseline levels of all self-report measures were assessed at this time point. A second assessment of resilience was collected in the Spring of 2020 (*M*days = 148.61, *SD =* 56.85, following the baseline assessment), when the strictest physical-distancing measures of the COVID-19 pandemic’s first wave were in place during their second semester of university.

**Analytic Plan**

Data were analyzed using a pre-registered analytic plan (<https://aspredicted.org/ZWC_4XW>). Competing models of resilience were tested using a multistage factor score regression approach (Hayes & Usami, 2020; Hoshino & Bentler, 2013). In factor score regression, factor scores from a measurement model are created for each construct of interest separately and saved in the first step. In a second step, the factor scores are treated as observed data in a subsequent regression analysis.

 Thus, in the first step, we extracted scores on latent factors representing levels of resilience during the university transition and the COVID-19 pandemic. To model resilience during the university transition, a latent factor was developed using the ‘lavaan’ packages for R (Rosseel, 2012) by regressing scores from the SWLS, SHS, and DSM-5 CC (reverse scored) during the university transition on a higher-order factor representing levels of resilience at this timepoint. Similarly, to model resilience during the COVID-19 pandemic, a latent factor was developed by regressing scores from the SWLS, SHS, and DSM-5 CC during the COVID-19 pandemic on a higher order factor, representing levels of resilience at this timepoint. The SHS was set as the marker variable across models (i.e., loadings fixed to 1; Kline, 1998). Scores on each of these latent factors were then extracted. Next, using a hierarchical regression approach outlined by Evans et al. (2010), Garmezy et al. (1984), and Hollister-Wagner et al. (2001), we employed the empirically derived risk and protective indices described above to test the four models of resilience: the compensatory model, the challenge model, the risk-protective model, and the protective-protective model. In this approach, the main effect for risk is entered in Block 1. The main effect for protection then is entered in Block 2; main effects for both risk and protection are subsequently interpreted in Block 2. Significance of both of these indices provides support for the compensatory model. Next, a risk x protection interaction term is entered in Block 3, and significance of this term provides support for the risk-protective model. Finally, a quadratic effect of risk (i.e., risk x risk interaction term) is entered in Block 4. The significance of the risk x protection term in Block 4 (when the risk x risk term also is included in the model) provides support for the protective-protective model, and finally, the significance of the risk x risk term in Block 4 provides support for the challenge model. Two separate analyses were conducted: the first testing models of resilience during the university transition, and the second testing models of resilience during the COVID-19 pandemic.

**Results**

**Preliminary Analyses**

Resilience across timepoints was associated with risk and protective terms in the expected directions. Specifically, correlation analyses indicated that resilience was positively associated with the cumulative protection index both during the university transition, *r* = .404, *p* <.001, and during the COVID-19 pandemic, *r* = .326, *p* <.001. Similarly, resilience was negatively correlated with the cumulative risk index both during the university transition, *r* = -.375, *p* <.001, and during the COVID-19 pandemic, *r* = -.325, *p* <.001.

**Measurement Model**

 A measurement model was developed for resilience during the university transition. This model was just-identified, and therefore only AIC (17841.47) and BIC (17871.35) were estimated. Standardized loadings for the resilience factor were .801, .821, and .667 (for the SWLS, SHS, and DSM-5 CC, respectively). R-square estimates were .642 (SWLS), .674 (SHS), and .445 (DSM-5 CC). We then developed a measurement model for resilience during the COVID-19 pandemic. This model also was just-identified (AIC = 8216.71, BIC = 8241.81). Standardized loadings were .755, .804, and .588 (for the SWLS, SHS, and DSM-5 CC, respectively). R-square estimates were .570 (SWLS), .646 (SHS), and .346 (DSM-5 CC).

**Pre-Registered Main Analyses**

The hierarchical regression analysis revealed a nuanced pattern of findings that differed across timepoints. Results of the final models are presented in **Table 3** (predicting resilience during the university transition) and **Table 4** (predicting resilience during the COVID-19 pandemic).

Findings indicated that the cumulative risk and protective indices (Block 2) were associated significantly with resilience during the university transition, *βs* ≥ |.34|, *ps* ≤.001. Similarly, both the cumulative risk and protective (Block 2) indices were associated significantly with resilience during the COVID-19 pandemic, *βs* ≥ |.27|, *ps* ≤ .001. This pattern of findings indicates support for the compensatory model across timepoints, suggesting that in the present sample, risk and protective factors contributed additively to resilience across time, with a greater number of risk factors decreasing resilience and a greater number of protective factors increasing resilience. In addition, the risk x protection interaction term was associated significantly with levels of resilience in Block 3 during the university transition, *β* = 0.10, *p* = .042, but not during the COVID-19 pandemic, *β* = -0.04, *p* = .651. Simple slopes analyses indicated that higher risk level was associated with lower resilience both when an individual had a high (+1 SD) level of protective factors, *B* = -0.96, *t*(1,071) = -6.03, *p* ≤ .001, and a low level (-1 SD) of protective factors, *B* = -1.40, *t*(1,071) = -10.21, *p* ≤ .001. Further, these slopes differed significantly, *z* = 2.07, p = .038, such that as protective factors increased, the influence of risk level on resilience decreased. We used the Johnson-Neyman technique to determine the region of significance; this analysis indicated that an individual’s risk score was no longer associated significantly with resilience (*p* > .05) when protective factors were at or above 3.80. This provides support for the risk-protective model and indicates that higher levels of protective factors, relative to lower levels of protective factors, had a greater buffering effect on the relation between risk factors and resilience during the university transition. Neither the challenge model nor the protective-protective model was supported during the university transition, *βs* < |.13|, *ps* ≥ .090, or the COVID-19 pandemic, *βs* < |.11|, *ps* ≥ .384. Notably, main effects of cumulative risk and protective indices remained significant following the inclusion of the risk x protection interaction term, *ps* < .001. This indicates robust support for the compensatory model across timepoints.

We next tested whether the findings reported above remained after including relevant covariates in the model. When the hierarchical regression analyses were repeated with significant covariates included in the model, an identical pattern of findings emerged: the cumulative risk and protective indices continued to be significantly associated with resilience during the university transition and the COVID-19 pandemic, *βs* ≥ |.33|, *ps* ≤ .001. In addition, the risk x protection interaction term continued to be associated with resilience during the university transition, *β* = .11, *p* = .027.[[1]](#footnote-1)

**Exploratory Post-Hoc Analyses**

Although gender was not associated with resilience during the university transition (*p* = .669) or the COVID-19 pandemic (*p* = .854), given increased awareness of the importance of gender-based analyses, we considered gender as a potential moderator and conducted post-hoc exploratory analyses examining the four proposed models of resilience. The interactions between gender and each of the predictors (i.e., main effects of risk and protective factors and interaction terms) were not significant in predicting resilience at either timepoint, *ps* ≥ .105. In line with this finding, subgroup analyses indicated that the compensatory model held among both women and men during the university transition, *βs*  ≥ |.40|, *ps* ≤ .001, and during the COVID-19 pandemic, *βs*  ≥ |.33|, *ps* ≤ .001. Intriguingly, subgroup analyses also indicated that the risk-protective model existed among women, *β* = .15, *p* = .010, but not among men, *β* = -0.06, *p* = .619, during the university transition.

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| **Table 3**Predicting resilience during the university transition |
| *Variable* | *B* | *β* | *SE B* | *p* |
| Risk*Block 2* | -1.193 | -.308 | .104 | <.001 |
| Protective*Block 2* | 1.381 | .344 | .108 | <.001 |
| Risk x Protective*Block 3* | .222 | .104 | .109 | .042 |
| Risk x Protective*Block 4* | .173 | .081 | .113 | .125 |
| Risk x Risk*Block 4* | -.150 | -.132 | .088 | .090 |

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| **Table 4**Predicting resilience during the COVID-19 pandemic |
| *Variable* | *B* | *β* | *SE B* | *p* |
| Risk*Block 2* | -1.088 | -.271 | .170 | <.001 |
| Protective*Block 2* | 1.157 | .272 | .180 | <.001 |
| Risk x Protective*Block 3* | -.088 | -.036 | .195 | .651 |
| Risk x Protective*Block 4* | -.145 | -.060 | .205 | .480 |
| Risk x Risk*Block 4* | -.125 | -.109 | .143 | .384 |

**Discussion**

This pre-registered work is the first to test four major models of resilience using a longitudinal design during emerging adulthood. During both the university transition and the COVID-19 pandemic, we found support for the compensatory model, which holds that risk and protective factors contribute additively to predict resilience. Intriguingly, during the university transition, we also found support for the risk-protective model, which posits that protective factors interact with risk factors in a buffering effect to reduce negative outcomes.

The support we found for the compensatory model both aligns with and extends findings from a number of studies testing this model across the lifespan (Anyan & Hjemdal, 2016; Askeland et al., 2020; Crandall et al., 2019; Hjemdal et al., 2007; Hurd et al., 2009; McLaren et al., 2007; McLaren & Challis, 2009; Ostaszewski & Zimmerman, 2006; Pisarska et al., 2016; Spence et al., 2016). In particular, two recent studies provide cross-sectional support for the compensatory model in the context of unique emerging adult samples: those transitioning out of child welfare (Goldstein et al., 2013) and Nigerian youth facing discrimination against LGBTQIA+ (Oginni et al., 2020) The current study extends prior work (Goldstein et al., 2013; Heinze et al., 2020; Oginni et al., 2020) by employing a longitudinal design among a diverse, international sample. As such, the present work bolsters the compensatory model as the most well-supported model of resilience across ages, genders, and contexts, and speaks to the importance of both mitigating risk factors and enhancing protective factors.

We also found support for the risk-protective model during the university transition, which aligns with prior work testing this model as a predictor of clinical outcomes and broader trajectories of well-being in youth and adults (Anyan & Hjemdal, 2016; Askeland et al., 2020; Hurd et al., 2009; McLaren & Challis, 2009; Ostaszewski & Zimmerman, 2006; Pisarska et al., 2016). However, while the risk-protective model was supported during the university transition, it was not supported during the COVID-19 pandemic. Recent work in emerging adults also has failed to find support for the risk-protective model (Heinze et al., 2020; Oginni et al., 2020). Heinze and colleagues (2020) posit that such inconsistencies may be attributable to characteristics of the stressor, such as the nature of the stressor and the degree to which it was experienced by each individual. As such, one potential explanation for our discrepant findings across timepoints is that emerging adults experienced a wide range of challenges during the COVID-19 pandemic. Indeed, given the variance in campus-, city-, and country-level responses to the pandemic, individuals would have faced a unique constellation of adaptational challenges. Moreover, individuals also likely showed substantial individual differences in their responses to those challenges, which is consistent with evidence that compensatory effects are stronger than buffering effects as inter-individual differences increase (Donnellan et al., 2009; Masten, 2001). An additional explanation for these discrepant findings relates to the specific risk and protective factors used in the present study. Risk and protective factors vary in their applicability depending on age, gender, and the specific stressor being encountered (Evans et al., 2010). For instance, academic self-efficacy and belongingness at university may have been particularly powerful buffers against risk factors during the university transition, yet comparatively less so during the COVID-19 pandemic.

Interestingly, we did not find support for either the protective-protective or challenge models. The current study is the first to test these models in emerging adulthood, and they have received limited support in the broader resilience literature, particularly in comparison to the compensatory and risk-protective models (Christiansen & Evans, 2005; Erdem & Slesnick, 2010; Evans et al., 2010; Gomez & McLaren, 2006; Hollister-Wagner et al., 2001; Hjemdal et al., 2007; McLaren & Challis, 2009). The protective-protective and challenge models place a greater emphasis on risk factors, whereas the compensatory and risk-protective models place a relatively greater emphasis on protective factors. This difference in emphasis may be particularly relevant in the current sample of emerging adults attending a post-secondary institution, as this group has greater access to protective resources (Erdem & Slesnick, 2010). Thus, when contextualized within the broader literature, our findings highlight the central role of protective factors across stressors and the lifespan.

Although the interaction between gender and the risk-protective term was not significant, exploratory analyses within genders indicated that the risk-protective model was supported during the university transition for women but not for men. In other words, a buffering association existed for women during the university transition wherein protective factors weakened the association between risk factors and resilience. There is both empirical and theoretical support for gender differences in resilience during adulthood (Lee et al., 2020; Yalcin-Siedentopf et al., 2021; Zubair et al., 2018), and researchers have posited various reasons to explain them, including gender-based differences in socialization and responses to adversity (Turton & Campbell, 2005; Matud, 2004; Rosario et al., 1998; Wang et al., 2007). In fact, researchers argue that gender-based differences in socialization and responses to adversity interact, with socialization not only informing the types of stressors that one is likely to experience but also influencing individual differences in the stress response (Dedovic et al., 2009). However, given the exploratory nature of these analyses, future work focused on elucidating gender-based differences in resilience among emerging adults is needed.

The present work has both theoretical and clinical implications. Theoretically, the four resilience models tested in the present study are not fundamentally competitive. Rather, investigating these models longitudinally can clarify the nature of resilience during emerging adulthood. Indeed, longitudinal examinations enable us to test whether resilience is trait-like (with factors influencing levels of resilience stably across time) *and* whether it is state-like (with factors manifesting differently across circumstances). Our findings support both the former and the latter. For example, we found that risk and protective factors had direct and independent effects on levels of resilience across timepoints, suggesting a trait-like stability to resilience. Concurrently, our results indicate a state-like aspect to resilience, such that during some – but not all – stressors, a buffering association exists between risk and protective factors. This nuanced understanding of resilience has the potential to inform future studies and methodologies in this area and has clinical implications. For example, understanding how risk and protective factors promote or impede resilience during stress can inform the content and timing of intervention and prevention efforts.

The current findings also highlight the central role of protective factors in promoting resilience during emerging adulthood. In doing so, this work underscores the importance of interventions that foster protective factors to promote positive coping in times of stress – and perhaps prioritizing these interventions over those that mitigate risk. Further, the current study examined protective factors across multiple domains of functioning (i.e., individual, school, family/community, and peer/social), given previous theoretical and empirical work identifying these domains as central in emerging adulthood (Arnett, 2000; Arnett, 2007; Evans et al., 2010). However, future work might examine whether it is necessary to have protective factors across all domains of functioning and the relative contribution of each domain.

Our findings should be interpreted in the context of several study limitations. First, risk and protective factors were measured at baseline. Although a number of the factors included in this study are generally considered static over time (e.g., first-generation student status), others (e.g., belongingness) have the potential to fluctuate. Future studies should extend the current work by examining the shifting nature of risk and protective factors over time. Next, the present work was conducted in an international sample of university students. While the risk for psychopathology and decreased well-being among university students has been well-substantiated (Auerbach et al., 2016, 2018), individuals who attend university tend to share certain qualities, such as more privileged socioeconomic backgrounds, that may differ from general community samples of emerging adults (Hanel & Vione, 2016). As a result, our findings may not generalize to emerging adults more broadly, and additional research is needed to investigate longitudinal trajectories of resilience in community samples of emerging adults, accounting for factors such as income, education, and socioeconomic status. Finally, the cumulative indices of risk and protective factors included in the current study were derived empirically from the literature examining risk and protective factors in emerging adulthood. However, it is impossible to rule out the possibility that other indicators may have revealed different trends. Thus, while the results of the current study are broadly in line with previous research that has found support for the compensatory and risk-protective models across the lifespan (Anyan & Hjemdal, 2016; Askeland et al., 2020; Goldstein et al., 2013; Heinze et al., 2020; McLaren et al., 2007; Oginni et al., 2020), future research incorporating a greater diversity of risk and protective factors may further extend this literature.

Motivated by recent evidence for the vulnerable nature of emerging adulthood (Auerbach et al., 2016), this pre-registered work is the first to test four primary models of resilience during emerging adulthood. Following two international samples across two ubiquitous, naturalistic, and successive stressors furthered our understanding of how risk and protective factors predict resilience during emerging adulthood. These results advance research on well-being in this cohort and have the potential to guide future theory development. Further, the results demonstrate that protective factors enhance resilience, regardless of an individual’s risk. As such, the present results highlight the dynamic nature of resilience and underscore the opportunity to enhance resilience in emerging adulthood through the promotion of protective factors.

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**Supplemental Online Materials for Jopling et al.**

Understanding Resilience in Emerging Adults: An International, Multi-Site Study

**Multi-Site Project Information**

These data came from a larger multi-site project involving 12 universities, listed here in alphabetical order: Karnatak University, India; New York University, USA; Northwestern University, USA; San Francisco State University, USA; Swinburne University, Melbourne, Australia; Temple University, USA; University of British Columbia, Canada; University of California, Berkeley, USA; University of California, Irvine, USA; the University of College London, UK; the University of Colorado, Boulder, USA; and University of Georgia, USA. The present investigation includes study data from all universities that collected all measures of interest (i.e., measures of resilience, risk factors, and protective factors). This included Temple University, the University of British Columbia, the University College London, and the University of Colorado, Boulder.

**Attrition**

 A total of *N* = 1,075 participants completed the pre-COVID baseline assessment during the Fall of 2019. Of these participants, 484 individuals completed the follow-up assessment during the spring of 2020. Individuals who completed the follow-up assessment did not differ from individuals who only completed the baseline assessment with respect to age, gender identity, or racial identity, *ts* ≤ |1.20|, *ps* ≥ .230.

**Covariates**

Theoretically motivated covariates used in previous work, including age, ethnicity[[2]](#footnote-2), and gender[[3]](#footnote-3) were examined. Age was not associated with levels of resilience either during the university transition (*p* = .211) or the COVID-19 pandemic (*p* = .912). However, ethnicity was associated with resilience during the university transition, *F*(3,1068) = 4.21, *p* = .006, but not during the COVID-19 pandemic, *F*(3,477) = 0.66, *p* = .579. Follow-up analyses indicated that individuals who identified as Asian had lower levels of resilience during the university transition compared to individuals who identified as White, *β* = .123, *p* < .001.

**Analyses Controlling for Site**

 When the hierarchical regression analyses were repeated with site controlled for in the model, an identical pattern of results emerged. The cumulative risk and protective indices continued to be significantly associated with resilience during both the university transition and during the COVID-19 pandemic, *βs* ≥ |.36|, *ps* ≤ .001. In addition, the risk x protection interaction term continued to be associated with resilience during the university transition, *β* = .11, *p* = .033.

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| **Table S1.** Descriptive statistics for key study variables across gender identities. |
|  | **Men** | **Women** | **Transgender/****Non-Binary** |
| **Risk Factors, *M (SD)*** | 1.36 (0.99) | 1.48 (0.99) | 1.00 (0.71) |
| **Protective Factors, *M (SD)*** | 1.37 (0.95) | 1.24 (0.96) | 1.20 (0.84) |
| **Resilience (University Transition: Fall 2019), *M (SD)*** | .004 (3.97) | .02 (3.84) | -1.53 (3.04) |
| **Resilience (COVID-19 Outbreak: Spring 2020), *M (SD)*** | -.05 (3.97) | .05 (3.87) | -1.38 (1.58) |

1. An identical pattern of findings also emerged when controlling for site; see **online supplement**. [↑](#footnote-ref-1)
2. Ethnicity was coded using k-1 (i.e., 3) dummy coded variables. Categories included the most highly endorsed identities which included White, Asian, and mixed race. [↑](#footnote-ref-2)
3. Gender was dummy coded as a binary flag variable (men, women) due to power considerations, given that only five individuals identified as non-binary or transgender; data for these five individuals are presented in the supplementary materials. [↑](#footnote-ref-3)