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COMMENTARY

Predicting and promoting resilience in later life

A commentary on "Contributors to mental health resilience in middle-aged and older adults: An analysis of the Canadian Longitudinal Study on Aging" by Hopper *et al.* (2023).

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There is something almost spellbinding about a person who flourishes despite the challenges life throws at them – what is their "secret"? The concept of "resilience" has intrigued researchers for decades, with the seminal work with children by investigators such as Emmy Werner and Michael Rutter leading the way in helping us to understand why some individuals manage to survive and thrive despite being exposed to the most challenging life circumstances (Rutter, 1979; Werner and Smith, 1989). Resilience is most commonly defined as the occurrence of positive adaptation when exposed to significant adversity (Cosco, Howse, *et al.*, 2017; Cosco, Kok, *et al.*, 2019; Hopper *et al.*, 2023; Miller-Lewis *et al.*, 2013). The definition specifies "adversity" as an inherent precondition of resilience, that is, "resilience" can only exist when there is experience of adversity. This multi-part nature of the phenomenon makes investigating resilience challenging because these adversity-adaptation dyads (of which there can be many permutations) need to be operationalized (Cosco, Kok, *et al.*, 2019).

As eloquently put by Michael Ungar (2019, p. 2), it is "important that resilience researchers answer the question: "Which *promotive and protective factors or processes* are best for which people in which *contexts* at what *level of risk exposure* and for which *outcomes*?." One can see from this statement the complex nature of resilience as a concept – to truly capture "resilience," a number of components need to be taken into account simultaneously. This has led to a range of different strategies for operationalizing the construct of resilience, and there is still no gold-standard method for measuring resilience (Cosco, Kaushal, *et al.*, 2017; Chmitorz *et al.*, 2018; Costenoble *et al.*, 2022; Ungar, 2019; Wister *et al.*, 2022). As pointed out by Costenoble *et al.* (2022) and others (Chmitorz *et al.*, 2018; Cosco, Kok, *et al.*, 2019), the different approaches to operationalizing resilience might yield different results, thus clouding research findings with inconsistent conclusions. We continue to deal with the same challenging issues we were facing a decade ago when I first published in this field of resilience research (Miller-Lewis *et al.*, 2013). But if we can get this right, the pay-off is huge in terms of the knowledge we can gain about the best tactics to increase the likelihood of resilient outcomes for people.

A considerable body of research has emerged about resilience in younger people, but there has been comparatively less attention to investigating resilience in older adults (e.g., Costenoble *et al.*, 2022; Hopper *et al.*, 2023; Ong *et al.*, 2009; Wister *et al.*, 2022). Yet understanding the way we as human beings adapt to adverse changes as we age is of vital importance, especially given the aging population growth worldwide. Aging comes with a set of inherent adversities humans are faced with, such as decline in physical functioning, multimorbidity, grief and bereavement, and even acceptance of one's own eventual mortality (e.g., Wister *et al.*, 2016, 2022). These adversities experienced in later life, in addition to the other adversities we accumulate during life, deserve consideration.

A gerontological research group based in Canada has recently been making considerable headway in furthering our understanding of resilience in older people (Cosco *et al.*, 2018; Cosco, Hardy, *et al.*, 2019; Wister *et al.*, 2020). Based on older adult participants in population-based cohort studies in Canada and Britain, these studies used different strategies to investigate resources associated with resilience, yet a common thread in their findings was that stronger

social support networks played a role in resilience to adversity.

The recently published study by Hopper *et al.* (2023), in this issue of *International Psychogeriatrics*, adds to the growing set of investigations by this research group that is delving into predictors of resilient outcomes in older people. Hopper and colleagues' (2023) study takes advantage of data gathered from a very large population-based sample of over 30,000 Canadian adults aged over 45, to identify factors contributing to mental health resilience. They conceptualize resilient outcomes in their study as better-than-expected mental health (fewer depressive symptoms) based on their level of objectively measured physical performance (a composite of grip strength, sit-to-stand movements, and standing balance). They provide a good example of a clearly outlined adversity-adaptation dyad for operationalizing resilience. Hopper *et al.* (2023) implemented the "resilience residuals" approach, which provides a quantified indicator of the extent to which a person's health outcomes are, in a statistical sense, better-than-expected or worse-than-expected given their level of exposure to adversities (i.e., ensuring that key "adversity component" within the definition of resilience is taken into account). The resilience residuals approach originated from studies of resilience in early childhood (e.g., Kim-Cohen *et al.*, 2004; Miller-Lewis *et al.*, 2013). In demonstration of the value of exploring research methods used in other domains for strategies that can be usefully applied in new disciplines, the residuals approach is now becoming more frequently used for studies in older adults (Cosco *et al.*, 2018; Hopper *et al.*, 2023; Yu *et al.*, 2022). The resilience residuals approach involves statistically regressing the variable representing adaptation on levels of the variable(s) representing adversity, and calculating the discrepancy between a person's actual adaptation score and the adaptation score predicted by their level of adversity. This residual variance score can then be used as a continuous vulnerability-to-resilience score, with the size of the residual quantifying the extent of their resilience (Hopper *et al.*, 2023; Miller-Lewis *et al.*, 2013). Cosco, Kok, *et al.* (2019) and Höltge and Ungar (2022) provide useful visual depictions of resilience residuals. Recent research indicates that the residuals method is a valid and reliable approach to operationalizing resilience (Cahill *et al.*, 2022). It is dynamic, process-oriented, and does not assume that a person demonstrates resilience at all times, during all stages of life, or in all life circumstances. This is where the residuals approach to operationalizing resilience is fundamentally different from measurement scales that assess resilience as a stable trait-oriented characteristic.

Though studies that use measurement tools designed to capture resilience at a stable dispositional level may offer useful insights into resilience in older people (e.g., Costenoble *et al.*, 2022), there are three key advantages with the residuals approach to resilience, all of which are clearly demonstrated by Hopper *et al.*'s (2023) study. First, the residuals approach provides, for every participant in a study, a quantified continuous resilience outcome variable score that accounts for the adversity-adaptation dyadic element inherent in the concept. Second, this continuous resilience outcome variable opens the door for the examination of potential resource factors that can predict resilient outcomes, including the exploration of more complex mechanisms through which these resource factors are interrelated and interact with each other to influence resilience. For example, the impact of distal resource factors on resilient outcomes might be mediated by more proximal resource factors. This information on the mediational processes and temporal pathways by which resources exert their effects on resilience provides valuable details about what resources should be prioritized for intervention and how they should be targeted (Cahill *et al.*, 2022; Miller-Lewis *et al.*, 2013). Third, the resilience residuals approach enables investigation into resilience in older individuals without the need to include an explicit resilience measurement tool in the assessment battery for the study (Cosco, Kok, *et al.*, 2019). This is particularly useful in large population cohort studies, where a number of constructs might be assessed, and a separate measure of resilience is not feasible for inclusion in the test battery. Combining adversity-adaptation dyads to conceptualize resilience outcomes based on the existing data in cohort studies is an opportunity of untapped potential. There are numerous existing secondary datasets from population cohorts across the world where the resilience residuals approach could be applied to available data in order to investigate promotive resources that predict resilience in older people. Hopper and colleagues (2023) have taken advantage of this opportunity using data from the population-based Canadian Longitudinal Study on Aging.

Hopper *et al.* (2023) hypothesized that in older people, socioeconomic position, leisure-time physical activity, and social networks would be related to mental health resilience (operationalized using the residuals approach as described above). They also hypothesized that both physical activity and social network would mediate the relationship between socioeconomic position and mental health resilience in middle- and older-age Canadians. In line with their hypotheses, Hopper *et al.*'s (2023) results demonstrated that indicators of holding a higher socioeconomic position were associated with greater

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mental health resilience. Additionally, participants reporting a greater frequency of leisure-based physical activity and larger social networks had greater mental health resilience. These modifiable resource factors, especially the extent of an individual's social network, were found to partially mediate the influence of socioeconomic position on mental health resilience. This implies that when socioeconomic position is low, one may be able to foster mental health resilience via increasing social networks and physical activity.

As the number of studies like Hopper *et al.*'s (2023) grow, and additional positive resources predictive of resilient outcomes in older people are discovered, they can provide valuable insights for developing intervention strategies. Hopper *et al.*'s (2023) findings offer us such insights regarding not just *what* to target in interventions but also *who* to target. They conclude that interventions encouraging leisure-based physical activities and activities that bolster social connections may help build mental health resilience in older adults, and such interventions may be particularly beneficial for older people from a lower socioeconomic position. Because the study is observational and cross-sectional, the authors rightly note that these recommendations are tentative and that future research is needed to infer causality in the direction of effects between variables. Yet given the paucity of resilience interventions designed for older adults (three systematic reviews of resilience interventions found none targeted at older people; Chmitorz *et al.*, 2018; MacLeod *et al.*, 2016; Macedo *et al.*, 2014), these knowledge contributions are sorely needed. One recently published pragmatic trial of a group intervention to increase resilience in seniors (Treichler *et al.*, 2020) is an important step forward, finding that a brief positive psychological intervention focused on gratitude, savoring, positive emotions, and values-based activities led to increased resilience. Also needed is an expansion beyond cross-sectional studies like Hopper *et al.* (2023) into prospective longitudinal studies (Cosco, Kaushal, *et al.*, 2017) capturing a greater period of the life course and which have the capacity to demonstrate temporal precedence of resource factors prior to resilient outcomes. Capitalizing further on existing population cohort studies tracking individuals over time will be worthwhile.

The flexibility of the resilience residuals approach for conceptualizing adversity-adaptation dyads representative of resilience also opens up opportunities to further expand on Hopper *et al.*'s (2023) research. Different combinations of adversities and adaptations can be investigated. For example, Cosco, Kaushal, and colleagues (2017) point out that most longitudinal studies measure the "positive adaptation" component of resilience as the absence of psychopathology, with few studies measuring "positive adaptation" with positively oriented constructs such as mental wellbeing and life-satisfaction. There is a need for resilience research to move beyond the deficit-based conceptualizations into asset-based understandings of resilient outcomes. There are also many resource factors that could be investigated as potential contributors to mental health resilience in older people, adding to the groundwork on the socioeconomic, physical activity, and social network resources considered in this initial study by Hopper *et al.* (2023). This might include external resources within one's wider socio-ecological environments, and resources internal within the individual, as commonly proposed in models of resilience (e.g., Wister *et al.*, 2016, 2022). Potential examples of internal resources worthy of further investigation are the capacity for emotional regulation and a positive outlook (Kiosses and Sachs-Ericsson, 2020; Treichler *et al.*, 2020).

In conclusion, while the debates continue about the best way to operationalize resilience in research (Cosco, Kok, *et al.*, 2019), like Ungar's (2019) recommendations for designing childhood resilience research, I suggest that future studies with older adults ensure they clearly and explicitly outline how they have operationalized and measured the key components of resilience: (a) adversity; (b) desired adaptive outcomes; and (c) the promotive resources under investigation. Consideration should also be given to using more than one method to operationally define resilience in the same study where there is adequate power, in order to determine if findings are convergent across methods of analysis. If similar resource factors emerge as predictive of resilience from different methodological approaches, this can increase our confidence that targeting these resources with concerted intervention efforts to foster resilient outcomes in the later years of life is a worthwhile endeavor.

Conflict of interest

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