

The Mediating Role of Resilience and its Facets in the Association between Mindfulness and  
Psychological Health

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## **Declarations**

### **Statement of Originality**

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to the final version of my thesis being made available worldwide when deposited in the University's Digital Repository, subject to the provisions of the Copyright Act 1968.

### **Acknowledgement of Collaboration**

I hereby declare that the work embodied in this thesis has been done in collaboration with other researchers. I declare that the data collection in the present study was completed by previous researchers: Marissa Black, Alexandra Arentz, Madeline Begg, and Callie Buller, as was the application to the Ethics Committee, development of the survey, data collection, reimbursements of participants, and data screening.

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### Abstract

**Objectives:** Mindfulness is associated with improved mental health and well-being.

However, the mechanisms by which mindfulness exerts its beneficial effects is not well understood. Psychological resilience has been identified as a possible mediating construct through which mindfulness affects psychological health. Previous research has tended to treat resilience as a unitary construct; however, a large body of research suggests resilience is multifaceted. Our study aimed to identify which key facets in the construct of resilience are responsible for mediating the association between mindfulness and psychological health.

**Methods:** This study involved the recruitment of 654 participants. After data screening, 506 participants remained. 78% of Participants were female and participants had a mean age of 31 years. Participants were comprised of members of the general population (51%), psychology students from the University of Newcastle (42%), and volunteers from the Hunter Medical Research Institute (7%). Data from the following measures were analysed: the Five Facet Mindfulness Questionnaire (FFMQ), the Resilience Scale for Adults (RSA), the Depression, Anxiety and Stress Scale – 21 item (DASS21), and the Satisfaction with Life Scale (SWLS).

**Results:** Our hypotheses were investigated using correlations and mediation analysis using the PROCESS computational tool (Hayes, 2012). Resilience was found to partially mediate the relationship between Mindfulness and Psychological Distress ( $\beta = -.32$ , CI:  $-.38, -.25$ ). Within this mediation, the most important facet of Resilience was found to be Perception of Self. Resilience was found to fully mediate the relationship between Mindfulness and Satisfaction with Life ( $\beta = .34$ , CI:  $.26, .41$ ). Within this mediation, the facets of Perception of Self and Planned Future were found to be the most important facets.

**Conclusions:** Our findings support the findings of previous research which suggests resilience mediates the relationship between mindfulness and satisfaction with life, further, we found evidence suggesting resilience mediates the relationships between mindfulness and

psychological distress. Our study provided evidence that resilience is best conceptualised as a multifaceted construct. This is based on the finding that specific facets of resilience vary in their correlation with mindfulness and psychological health and also vary in their contributions to the mediation between mindfulness and psychological health. Our findings suggest future research into resilience would benefit from conceptualising resilience as multifaceted and exploring further the role of individual facets.

**Keywords:** mindfulness, resilience, psychological distress, satisfaction with life

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### **The Mediating Role of Resilience and its Facets in the Association between Mindfulness and Psychological Health**

Mindfulness has historically been associated with contemplative traditions, particularly Buddhism (Baer, 2003). More recently, mindfulness has been integrated into contemporary psychology and is an integral component of the ‘third wave’ of psychological therapies (Dimidjian & Linehan, 2003; Hayes, 2004; Kabat-Zinn, 1982). Mindfulness has been described as awareness involving paying attention to the present moment, deliberately, and non-judgementally (Kabat-Zinn, 1994). In contemporary psychology, mindfulness is regarded as a set of skills which can be acquired and developed in order to reduce psychopathology and increase wellbeing (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). Mindfulness-based clinical interventions, including mindfulness-based stress reduction (MBSR) and mindfulness-based cognitive therapy (MBCT) have demonstrated efficacy in the treatment of depression and anxiety (Khoury et al., 2013). Further, higher levels of mindfulness have been associated with increased levels of subjective wellbeing (Baer et al., 2008).

#### **Dispositional Mindfulness**

Mindfulness has been conceptualised and researched as both a state (momentary condition) and trait (enduring characteristic) (Tomlinson, Yousaf, Vittersø, & Jones, 2017). State mindfulness can be improved by psychological interventions such as MBSR and MBCT (Segal, Williams, & Teasdale, 2002). Trait mindfulness refers to one’s *tendency* to be mindful in every-day life (Brown and Ryan, 2003) and can be increased through mindfulness training and meditation (Creswell, Pacilio, Lindsay & Brown, 2014). Trait mindfulness is referred to as dispositional mindfulness (Tomlinson et al., 2017) and will be a focus of the current study. Dispositional mindfulness has been associated with improved mental health, including lower rates of anxiety and depression, among both clinical and non-clinical

populations (Branstrom, Duncan, & Msokowitz, 2011; Freudenthaler, Turba, & Tran, 2017; Rasmussen & Pidgeon, 2010).

### **Mediating Factors in the Association between Mindfulness and Psychological Health**

Despite a burgeoning literature highlighting the positive effects of mindfulness on psychological wellbeing, the mechanism by which mindfulness affects wellbeing remains unclear (Freudenthaler et al., 2017). Current research suggests mindfulness may impact wellbeing through mediators including emotional intelligence, cognitive processes, core self-evaluation, self-esteem, and emotion regulation. However, these factors only partially mediate the relationship between mindfulness and wellbeing (Schutte & Malouff, 2011; Pepping, O'Donovan, & Davis, 2013; Freudenthaler et al., 2017; Tomlinson et al., 2018).

Resilience has been highlighted as another factor mediating the relationship between mindfulness and subjective wellbeing (Bajaj & Pande, 2016). However, some disagreement exists in the literature regarding how to conceptualise mindfulness with regards to resilience. Thompson, Arnkoff, and Glass (2011) conceptualised mindfulness as a component of resilience. Bajaj and Pande (2016), on the other hand, conceptualised mindfulness as distinct from resilience and found that resilience partially mediated the effect of mindfulness on satisfaction with life and positive and negative affective states. However, as both mindfulness and resilience are multifaceted constructs (Davydov, Stewart, Ritchie, & Chaudieu, 2010), the exact relationships between mindfulness and resilience remain unclear. The present study aims to better understand the relationship between mindfulness and resilience.

### **Resilience and Psychological Health**

Resilience has been operationalized in a number of ways throughout the literature making it difficult for researchers to compare measures of resilience across studies. However,

despite contention in how to define resilience, most definitions are based around two key concepts: adversity and positive adaptation (Fletcher & Sarkar, 2013).

Furthermore, rather than representing a single factor, resilience has been conceptualised as a multifaceted construct (Fletcher & Sarkar, 2013). Bajaj and Pande (2016) argue resilience is a multifaceted construct which helps an individual cope and achieve good adjustment despite adversity (Bajaj and Pande, 2016) and can be innate or acquired (Davydov et al., 2010). Resilience has been defined as a range of protective factors, processes, and mechanisms that contribute to a good outcome in the face of stressors associated with psychopathology (Hjemdal, Friborg, Stiles, Rosenvinge, & Martinussen, 2006). Resilience is associated with reduced psychopathology in the face of life stress (Hjemdal et al., 2006; Southwick, Vythilingam, & Charney, 2005) and increased subjective wellbeing (Liu, Wang, & Li, 2012; Pidgeon & Keyes, 2014).

A range of attempts have been made to operationalize resilience. Jew, Green, and Kroger (1999) developed a scale which emphasised twelve key skills that comprise resilience. Further, Wagnhild and Young (1993) developed the Resilience Scale after interviewing older women who had dealt with numerous difficulties in their lives. However, neither of these measures included measures of social factors which represent a vital component in the concept of resilience (Friborg, Hjemdal, Rosenvinge, & Martinussen, 2003). The Resilience Scale for Adults (RSA) represents a measure of resilience which demonstrates good psychometric properties and addresses the multifaceted nature of resilience as a construct (Hjemdal et al., 2006).

Previous conceptions of resilience divided the construct into three categories; psychological/dispositional attributes, family support and cohesion, and external support systems (Werner, 1993; Garmezy, 1993; Rutter, 2001). Research by Hjemdal and colleagues

(2011) further categorized the construct of resilience and suggested resilience consists of six facets. These six facets are represented in the *Resilience Scale for Adults* (RSA) (Hjemdal, Friborg, Martinussen, & Rosenvinge, 2001).

### **The Specific Facets of Resilience**

The process of identifying the six facets of resilience in the RSA involved conducting a large literature review which identified important protective factors (Hjemdal et al., 2011). These factors were then reduced to 15 categories of protective factors. A series of studies using exploratory and confirmatory factor analysis resulted in a six-factor structure for resilience with 33 items (Friborg, Barlaug, Martinussen, Rosenvinge, & Hjemdal, 2005; Hjemdal et al., 2011). The six factors identified from these studies are: (1) Perception of Self, (2) Planned Future, (3) Social Competence, (4) Structured Style, (5) Family Cohesion, and (6) Social Resources. The six facets of resilience as measured by the RSA are a key focus of this paper and descriptions of each facet will be provided in the methods section.

### **The Relationship between Mindfulness and Resilience**

While Bajaj and Pande (2016) obtained results suggesting resilience may mediate the relationship between mindfulness and wellbeing/affect, their methodology did not allow for the identification of the specific facets of resilience most responsible for this mediation effect. The precise mechanism by which mindfulness exerts its helpful influence remains unclear. Thompson and colleagues (2011) suggested mindfulness helps prevent rumination and depressogenic thinking styles. Shapiro, Brown, and Biegel (2007) concluded resilience may be higher in more mindful individuals as they engage less in habitual worrying. Langer and Moldoveanu (2000) suggested mindfulness is associated with less automatic and non-adaptive reacting, more creativity, and increased capacity to cope with difficult thoughts and emotions. Neuroscientific explanations suggest mindfulness builds connections between the

prefrontal cortex and the amygdala which assists people in disengaging from difficult thoughts (Davidson & Begley, 2012).

Bajaj and Pande (2016) summarise the existing literature and conclude that mindfulness is antecedent to resilience, and resilience is associated with greater satisfaction with life and improved affect. A current gap exists in the literature concerning the role of resilience in the association between mindfulness and psychological symptoms. Bajaj and Pande have demonstrated resilience mediates the relationships between mindfulness and satisfaction with life; however, the specific facets of resilience responsible for this mediation remain unclear as previous studies have tended to treat mindfulness and resilience as single-factor constructs (Keye & Pidgeon, 2013; Smith et al., 2011). Further, while outcomes including satisfaction with life and affect have been explored, no study to date has explored whether resilience mediates the relationships between mindfulness and the outcome of psychological distress. The absence of psychological distress is an important component of wellbeing and psychological adjustment (Hone, Jarden, Schofield, & Duncan, 2014).

### **Aims and Hypotheses**

In summary, previous research has demonstrated that the relationship between mindfulness and psychological health is mediated by a variety of variables (Schutte & Malouff, 2011; Freudenthaler et al., 2017). Previous research has explored the mediating role of resilience in the relationship between mindfulness and wellbeing indices including satisfaction with life, and positive and negative affect (Bajaj and Pande, 2016). However, an important component of wellbeing is the absence of psychological distress (Hone, Jarden, Schofield, & Duncan, 2014). Further, previous studies have not sought to understand the role of resilience at the specific facet level. The present study aims to fill these gaps. This research is important as both resilience and mindfulness are factors which can be developed and built

upon through clinical interventions (Hayes, 2004; Vanhove, Herian, Perez, Harms, & Lester, 2016) and have significant effects on wellbeing and psychological distress.

Firstly, we expected to find resilience mediates the relationship between mindfulness and psychological distress. Further, we seek to replicate the findings that resilience mediates the relationship between mindfulness and satisfaction with life (Bajaj & Pande, 2016). Figures 1 and 2 provide diagrammatic representation of the expected mediating relationships between resilience and mindfulness and psychological distress and satisfaction with life.

Secondly, we sought to better understand which specific facets of resilience are most responsible for the hypothesised mediation effects between mindfulness and psychological health. We expected the most important facets of resilience would be Perception of Self, Planned Future, and Social Competence. We believed these facets had the most overlap with the construct of mindfulness as they pertain to cognitive processes which are likely influenced by mindfulness such as views of the self and views of the future. Further we believed Social Competence would be related to mindfulness due to its emphasis on flexibility within social contexts; psychological flexibility is considered an important component of mindfulness (Moore & Malinowski, 2009). We expected to find the remaining facets of Family Cohesion, Social Resources, and Structured Style to be less important in the hypothesised mediation effect due to their lack of conceptual overlap with mindfulness.

## **Method**

### **Participants**

This study included 654 participants recruited as part of a larger cross-sectional study that was conducted from 2014 to 2015. After screening, data from 506 participants remained. 148 participants began but did not complete all items on the questionnaire, and consequently these data were not included. Participants were 397 females (78%) and 109 males (22%),

aged between 18 and 82 years old ( $M = 31.38$  years,  $SD = 14.23$ ). The only restrictions on participation were that participants were Australian residents, at least 18 years old, and able to access a computer and the internet. Participants consisted of 212 undergraduate psychology students from the University of Newcastle (UoN; 42%), 259 members of the general population (51%), and 35 volunteers from the Hunter Medical Research Institute (HMRI; 7%). When reporting ethnicity, 228 participants (45%) reported they were Australian, 202 participants (40%), reported they were European Australian, and 76 participants (15%) reported they were of another ethnicity.

### **Procedure**

Eligible undergraduate psychology students were recruited via a university online system where the study was advertised. Students enrolled in psychology courses received course credits for participating in the study. Eligible participants from the general population were recruited via advertisement on the Relationships and Psychological Health Lab website, Facebook, and posters placed around the university campus. For taking part in the study they were offered the opportunity of being entered in a lottery with the chance to win one of twenty-four \$50 gift vouchers. Eligible participants from the HMRI volunteer register were randomly selected and invited to participate. They were not offered any monetary reimbursement for participation.

An online questionnaire was administered using LimeSurvey software. Participation was voluntary, and participants could withdraw from the research at any time. The UoN Human research Ethics Committee approved the study and a consent form was developed in adherence to the standards outlined by the National Statement on Ethical Conduct in Human research (National Health and Medical Research Council, 2007).



Participants first read the information statement and those who agreed to the study were then required to give informed consent by completing the online consent form. They were then directed to the online questionnaire. Participants who did not give consent were unable to access the questionnaire. Completion time was approximately between 40 and 50 minutes. Participants completed a range of questionnaires not all specific to this study.

## Measures

**Mindfulness.** The *Five-Facet Mindfulness Questionnaire* (FFMQ) is a widely used, 39-item self-report measure of dispositional mindfulness with good reliability and validity (Christopher, Neuser, Michael, & Baitmangalkar, 2012) which integrates items from existing mindfulness questionnaires (Brown and Ryan, 2003; Buchheld, Grossman, & Walach, 2001). The FFMQ is comprised of five facets: (1) Observing (8 items), (2) Describing (8 items), (3) Acting with Awareness (8 items), (4) Non-Judging (8 items), and (5) Non-Reactivity (7 items) (Baer et al., 2008). The FFMQ demonstrates good construct validity, good internal consistency with Cronbach's alphas ranging from 0.86 to 0.93 (Christopher et al., 2012), and adequate test-retest reliability (Baer et al., 2006). The present study produced good internal consistency with a Cronbach's alpha value of .92 for the overall scale.

**Resilience.** The *Resilience Scale for Adults* (RSA) is a 33-item self-report scale for measuring resilience factors among adults (Hjemdal, et al., 2011). The RSA has been researched extensively and found to be reliable and valid (Friborg et al., 2003, Friborg et al., 2005; Hjemdal et al., 2006; Hjemdal et al., 2011). Items on the RSA are rated on a 7-point semantic differential scale where each item has polar descriptors at each end of the response continuum i.e. "I enjoy being...together with other people" (1 point) and "I enjoy being...by myself" (7 points). The revised version of the RSA used in this study is comprised of six-factors: (1) Perception of Self, (2) Planned Future, (3) Social Competence, (4) Structured

Style, (5) Family Cohesion, and (6) Social Resources (Friborg et al., 2005). Hjemdal and colleagues (2011) suggest the psychometric properties of this scale are good. The RSA demonstrates good test-retest reliability and internal consistency with the developers of the RSA reporting a Cronbach's alpha of 0.84. The present study demonstrated good internal consistency with a Cronbach's alpha value of .92 for the total scale. The specific facets and their importance is a key focus of this paper; we will now briefly discuss the theoretical underpinnings of each facet. Perception of Self refers to items that measure confidence in one's own abilities and judgements, self-efficacy, and realistic expectations. Responses scoring highly in this domain would include "Belief in myself gets me through difficult periods". Planned Future refers to items measuring the ability to plan ahead, have a positive outlook, and be goal oriented. Responses scoring highly in this domain include "I feel that my future looks very promising". Social Competence refers to items measuring levels of social warmth and flexibility, ability to establish friendships, and the positive use of humour. Responses scoring highly in this domain include "For me, thinking of good topics for conversation is easy". Family Cohesion refers to whether values are shared by one's family, whether one enjoys spending time with one's family, loyalty between family members, and a feeling of mutual appreciation and support between one and one's family members. Responses scoring highly in this domain include "I feel very happy with my family". Social Resources refers to the availability of social support and one's supports outside the family unit. Responses scoring highly in this facet include "When needed, I have always someone who can help me". Lastly, Structured Style refers to the preference for having and following routines, being organized, and for having clear goals. Responses scoring highly in this facet include "Rules and regular routines are a part of my everyday life".

**Psychological distress.** The *Depression, Anxiety, and Stress Scale* (DASS21) was used to measure psychological distress (Lovibond & Lovibond, 1995). The DASS21 is a 21-

item self-report measure. The DASS21 yields three subscales: (1) depression, (2) anxiety, and (3) stress. The DASS21 total score is seen as a measure of general psychological distress (Henry & Crawford, 2005). The DASS21 has been demonstrated to have good psychometric properties including reliability and validity when used in both clinical and non-clinical samples (Antony, Bieling, Enns, & Swinson, 1998). The present study had good internal consistency with a Cronbach's alpha value of .93 for the total Psychological distress scale.

**Satisfaction with life.** The Satisfaction with Life Scale (SWLS) (Diener, Emmons, Larsen, & Griffin, 1985) was used. The SWLS is a five-item self-report measure whereby participants respond using a seven-point likert scale. Participants are asked to respond to statements such as "In most ways my life is close to ideal" with responses ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The SWLS has good psychometric properties including high internal consistency, temporal reliability, has demonstrated validity with a range of age groups. The SWLS demonstrates good convergent validity (Diener et al., 1985). The present study had good internal consistency with a Cronbach's alpha value of .88 for the total scale.

## Results

The aim of statistical analysis in this paper was to screen the data, compute means and standard deviations of the variables, explore correlations between key variables, and explore direct and indirect effects in mediation models using the PROCESS tool (Hayes, 2012).

### Data Screening

The data were screened for non-completion, normality, skewness, and for univariate and multivariate outliers. Using the Mahalanobis distance procedure outlined by Tabachnik and Fidell (2007), no multivariate outliers were detected. The SPSS software package was used to generate histograms to assess normality. Scores on the FFMQ were normally

distributed, however scores on the RSA were positively skewed, and scores on the DASS21 and SWLS were both positively skewed. However, a normal distribution was not expected for these measures as this is consistent with community samples of these measures. Further, given the large sample size and use of statistical methods which are robust to the effect of non-normal distributions (Tabachnik & Fidell, 2007), the data were retained unadjusted.

### **Descriptive Statistics and Correlations**

Correlations between the variables of Mindfulness, Psychological Distress, Satisfaction with Life, Resilience, the specific facets of Resilience are displayed in Table 1. In general, the observed correlations between variables were as expected. Overall Mindfulness had a large and positive association with Resilience (.630). Of note, we found Mindfulness had a stronger association with Psychological Distress than Satisfaction with Life; we found a large and negative correlation between Mindfulness and Psychological Distress (-.519), whereas we found a positive and medium-sized association between Mindfulness and Satisfaction with Life (.369).

Resilience was found to be more strongly associated with Psychological Distress than Satisfaction with Life. We observed a large and negative association between Resilience and Psychological Distress (-.630) and positive and large, albeit apparently smaller association between Resilience and Satisfaction with Life (.556).

In relation to the second aim of this paper in identifying the most important facets of Resilience in the hypothesised mediation effect, we found several noteworthy findings. Mindfulness was found to be more strongly associated with Perception of Self (.70), Planned Future (.49), Social Competence (.45) and Social Resources (.41) but was less strongly associated Family Cohesion (.34), and Structured Style (.30). These results partially supported our assertion that the facets of Perception of Self, Planned Future, and Social

Competence would be the most conceptually related facets to Mindfulness with the somewhat unexpected finding that Social Resources also appeared conceptually related to Mindfulness.

When comparing the facets of Resilience and their associations with the outcome of Psychological Distress, we found strong negative associations between Psychological Distress and Perception of Self (-.59), Planned Future (-.51), and Social Resources (-.50). For the outcome of Satisfaction with Life we found strong associations with the facets of Perception of Self (.50) and Planned Future (.53).

### **Mediation Analyses**

Mediation effects were analysed using the PROCESS macro tool (Hayes, 2012). We examined the direct and indirect associations between Mindfulness, Resilience, Psychological Distress, and Satisfaction with Life. Using bootstrapping analysis with 5000 samples, direct and indirect associations are considered significant if the 95% confidence intervals do not contain zero. Figures 3 and 4 summarise these findings.

**Mindfulness, Resilience, and Psychological Distress.** The standardised association of Mindfulness with Resilience was positive and large ( $\beta=.63$ , 95% CI: .56, .70). The  $R^2$  value indicated that Mindfulness explained 40% of the variance in Resilience. The standardised association of Resilience with Psychological Distress was large and negative ( $\beta=-.50$ , 95% CI: -.59, -.42). The standardised direct association of Mindfulness with Psychological Distress was negative and small ( $\beta=-.20$ , CI: -.29, -.12). However, the standardised indirect association of Mindfulness with Psychological Distress was negative and medium size ( $\beta=-.32$ , CI: -.38, -.25). Significantly, the total effect of Mindfulness on Psychological Distress was negative and large ( $\beta=-.52$ , CI: -.59, -.44). The  $R^2$  value indicated that Mindfulness explained 42% of the variance in Psychological Distress when the mediator of Resilience was

included. These findings indicated that Resilience partially mediated the relationship between Mindfulness and Psychological Distress.

**Mindfulness, Resilience, and Satisfaction with Life.** The standardised association of Mindfulness with Resilience was positive and large ( $\beta=.63$ , 95% CI: .56, .70). The  $R^2$  value indicated that Mindfulness explained 40% of the variance in Resilience. The standardised association of Resilience with Satisfaction with Life was positive and large ( $\beta=.54$ , 95% CI: .44, .63). The standardised direct association of Mindfulness with Satisfaction with Life was found to be non-significant. However, the standardised indirect association of Mindfulness with Satisfaction with Life was positive and of medium size ( $\beta=.34$ , CI: .26, .41). The total effects of Mindfulness on Satisfaction with Life were positive and of medium size ( $\beta=.34$ , CI: .26, .41). The  $R^2$  value indicated that Mindfulness explained 31% of the variance in Satisfaction with Life when the mediator of Resilience was included. These findings indicated that Resilience fully mediated the relationship between Mindfulness and Satisfaction with Life.

**The Mediating Role of the Specific Facets of Resilience.** Further to our aims of investigating Mindfulness, Resilience and their associations with Psychological Distress and Satisfaction with Life, we also examined the extent to which each specific facet of Resilience mediated the association between Mindfulness with Psychological Distress and Satisfaction with Life. We will only report significant findings in this section with the complete findings available in Table 2.

When examining the effect of specific facets of Resilience in the relationship between Mindfulness and Psychological Distress, we found that the facet of Perception of Self was clearly the most important contributor to the mediation effect. The standardised indirect association for Perception of Self was negative and of medium size ( $\beta = -.32$ , CI: -.40, -.24).

Other noteworthy yet modest contributors to the mediation effect were Planned Future ( $\beta = -.16$ , CI:  $-.22, -.11$ ), and Social Resources ( $\beta = -.14$ , CI:  $-.19, -.10$ ). As expected, Perception of Self was an important contributor to the mediation effect, however, our expectation that Planned Future would be an important mediator was only partially supported as this facet showed a weak mediation effect. Further, our expectation that Social Competence ( $\beta = -.10$ , CI:  $-.15, -.06$ ) would be an important mediator was not supported in our findings.

When examining the effect of specific facets of Resilience in the relationship between Mindfulness and Satisfaction with Life, we found that two facets were found to be of greater importance than the others. Firstly, the standardised indirect association through the mediator of Perception of Self was positive and of medium size ( $\beta = .34$ , CI:  $.26, .41$ ). Secondly, the standardised indirect association through the mediator of Planned Future was positive and of small size ( $\beta = .23$ , CI:  $.17, .29$ ). These findings were consistent with our expectations; however, a somewhat surprising finding was that Social Competence ( $\beta = .08$ , CI:  $.03, .13$ ) was not found to be important in the mediation effect between Mindfulness and Satisfaction with Life.

## Discussion

The present study investigated the mediating role of resilience in the relationship between mindfulness and psychological health. The results indicate that resilience partially mediates the relationship between mindfulness and psychological distress and that it fully mediates the relationship between mindfulness and satisfaction with life. Regarding the importance of the individual facets of resilience, we found Perception of Self was the most important mediating facet in the relationship between mindfulness and psychological distress and that both Perception of Self and Planned Future were the most important mediating facets in the relationship between mindfulness and satisfaction with life.

### **The Mediating Role of Resilience between Mindfulness and Psychological Distress**

As hypothesised, we found that resilience partially mediated the relationship between mindfulness and psychological distress. This finding is similar to the results obtained by Bajaj and Pande (2016) who found that resilience partially mediated the association between mindfulness and negative affect states, a construct that is different but related to psychological distress. This finding suggests that part of the negative association between mindfulness and psychological distress is explained by the mediation pathway through resilience.

The second aim of this study was to better understand what the relevant facets of resilience are in the mediation between mindfulness and psychological distress. Previous research has tended to treat resilience as a single factor construct; however, a large body of literature suggests that resilience is better understood as a multifaceted construct (Hjemdal et al., 2011; Friberg et al., 2005). We therefore endeavoured to better understand which are the most salient facets of resilience in its relationship with mindfulness and psychological distress. We found Perception of Self to be the most important mediating facet of resilience. Perception of Self relates to individuals' confidence in their own abilities and judgements, self-efficacy, and self-expectations (Hjemdal et al., 2011); people scoring highly in this facet may provide such responses as "When something unforeseen happens I always find a solution". Whilst beyond the scope of this study to explore why this specific facet of resilience mediates the association between mindfulness and psychological distress, it is possible that self-perception correlates with other constructs such as self-compassion which have been demonstrated to be associated with both mindfulness and lower levels of psychological distress (Friis, Johnson, Cutfield, & Consedine, 2016). Further, previous research has suggested mindfulness reduces habitual worrying, automatic reacting, depressogenic thinking styles, and rumination (Thompson et al., 2011; Shapiro et al., 2007;



Langer and Moldoveanu, 2000). These mental processes are likely to negatively impact one's perception of self and this may explain why mindfulness is associated with improved perception of self. Consistent with the conclusions of previous authors in this field, we believe mindfulness likely offers a protective 'buffer' against the distressing effects of unhelpful automatic thoughts and assists individuals in adopting a decentred stance towards distressing experiences (Thompson et al., 2011). These cognitive processes in turn assist individuals in managing difficult experiences without shutting down or acting in non-adaptive ways. Simply put, more mindful individuals are likely to enjoy more positive perceptions of themselves which confers resilience in the face of stressors (Bajaj and Pande, 2016).

### **The Mediating Role of Resilience between Mindfulness and Satisfaction with Life**

While we hypothesised, resilience would mediate the relationship between mindfulness and satisfaction with life, we in fact found resilience fully mediated this relationship. These results deviate somewhat from those obtained by Bajaj and Pande (2016) who only found a partial mediation effect. Our findings have important implications in that this suggests that the positive relationship between mindfulness and satisfaction with life occurred wholly through the mediator of resilience.

The results indicate that Perception of Self and Planned Future were the most important mediating facets of resilience. Planned future refers to the ability to plan ahead, have a positive outlook, and be goal oriented (Hjemdal et al., 2011). The theoretical underpinnings of this finding may include the fact that mindfulness is associated with improvements in clarifying goals and confidence in obtaining goals and also serves to increase hopefulness about the future (Crane, Winder, Hargus, Amarisinghe, & Barnhofer,

2011; Munoz et al., 2018). These psychological benefits are likely to increase one's satisfaction with life.

### **Facets of Resilience and their Importance**

Perception of Self was found to be an important mediator in the relationship between mindfulness and psychological health. This is consistent with previous research which suggested that individuals with higher levels of mindfulness were more likely to remain focused on present experiences, and less likely to experience negative self-beliefs or engage in critical self-talk (Bajaj, Robins, & Pande, 2016). This helps to preserve a positive perception of self which in turn provides a buffer from psychological distress. The relationship with the self is a key concept in the mindfulness literature and our findings suggest one's perception of self directly influences psychological distress and satisfaction with life (Thompson & Waltz, 2007). Bajaj and Pande (2016) suggest resilience may be associated with personality characteristics like optimism, zest, and patience which may serve to increase satisfaction with life. Further, these findings are consistent with those of Kong, Wang, and Zhao (2014) who found that mindfulness predicted satisfaction with life through the mediator of Core self-evaluations. Core self-evaluations as a construct appears similar to the resilience facet of Perception of Self. This suggests mindfulness is associated with improved evaluations of self which is in turn associated with improved life satisfaction. Kong and colleagues (2014) go further to suggest that enhanced self-evaluation may be an indirect consequence of self-compassion, an important ingredient of mindfulness, which then goes on to increase satisfaction with life.

Planned Future was also found to be an important mediator between mindfulness and satisfaction with life. This was somewhat surprising given mindfulness' focus on the present moment. However, these findings appear consistent with those obtained by Gregoire,

Bouffard, and Vezeau (2012) who found individuals scoring higher in mindfulness tended to have more autonomously motivated goals which in turn appeared to foster wellbeing. Further, Crane and colleagues (2011) found that more mindful individuals were better able to clarify their important goals and in turn increase their confidence in their ability to achieve those goals. This interpretation appears to have good face-validity when looking at high-scoring responses for this facet such as “My goals; I know how to accomplish”. Our findings provide support for the idea that mindfulness better enables individuals to focus on goals, move towards goals, and maintain hopefulness about the future which may in turn improve an individual’s satisfaction with life. However, it is also possible that people scoring highly in mindfulness have goals that differ qualitatively to those lower in mindfulness (Crane, Jandric, Barnhofer, & Williams, 2010). Further research is needed to clarify the mechanism responsible for this observed difference.

In summary, resilience was found to mediate the relationship between mindfulness and psychological health. Bajaj and Pande (2016) summarised the theoretical underpinnings of this finding as being the awareness and acceptance associated with mindfulness may contribute to the development of greater resilience and that the optimism, passion, and patience of resilient individuals may lead to greater psychological health (Thompson et al., 2011). Importantly, mindfulness and resilience are both constructs which can be developed through psychological interventions. Further, both mindfulness and resilience are important for reducing psychological distress and improving satisfaction with life.

In terms of clinical implications, future research is required, however, it is conceivable that mindfulness-based interventions may represent a viable pathway for improving resilience and in turn improving psychological health. Further, our results suggest that it may be more time and resource efficient to focus specifically on interventions that target the facets of Perception of Self and Planned Future. For instance, mindfulness

interventions that specifically aim to reduce distressing self-talk and increase self-compassion may represent effective intervention targets which relate to the facet of Perception of Self.

### **Limitations and Strengths**

There are several limitations to the present study. Firstly, it is cross-sectional in nature and therefore is only able to capture participants' responses at one time point. As such, no causal relationships can be concluded. Future research may benefit from longitudinal forms of data collection as this would allow for a better understanding of the nature of the relationships between variables. Specifically, future researchers may wish to monitor changes in resilience and psychological health over time during a mindfulness-based intervention such as Mindfulness Based Stress Reduction (MBSR) in order to make causal claims about the relationship between mindfulness, resilience, and psychological health. Secondly, this study collected data in the form of a self-report format. Whilst self-report is widely accepted in the field (Paulhus & Vazire, 2007), future research would benefit from mixed-methods data collection including both self-report and observational data collection in order to address some of the limitations of self-report measures. For instance, Killingsworth and Gilbert (2010) employed an 'experience sampling' technique for data collection whereby participants were prompted at specific times to report their current levels of mindfulness. This approach may address some of the limitations of research reliant upon self-report. Given the popularity of mindfulness in current mainstream culture, it is possible that self-report measures of mindfulness were more prone to social desirability biases in responses (Grossman and Van Dam, 2011). Future research would benefit from including a social desirability scale to better control for this potentially confounding variable.

This study specifically measured dispositional, or trait, mindfulness. Research aimed at exploring the use of mindfulness interventions rather than trait measures of mindfulness

would increase our understanding of possible causal relationships between mindfulness, resilience, and psychological health.

Further research needs to examine the nature of the relationship between mindfulness' facets and the facets of resilience. This may shed further light on the conceptual question of whether mindfulness and resilience are conceptually distinct or overlapping constructs. Relatedly, future research may be aimed at examining associations between specific facets of mindfulness and specific facets of resilience. A full exploration of the associations between all the facets of mindfulness and all the facets of resilience were beyond the scope of the present study. However, it is recommended that this be given some consideration in future research as mindfulness, like resilience, has been argued to be a composite construct.

While our paper focused on the specific mediator of resilience, future research should explore the relative contributions of resilience compare to other mediators such as emotion-regulation and self-compassion (Pepping et al., 2013). This would better enable us to judge the relative importance of resilience in comparison to other mediating constructs between mindfulness and psychological health.

Future research would also benefit from using more ethnically diverse samples as the present study's sample involved 85% of participants identifying as either Australian or European Australian. Previous research has indicated different cultures may vary in levels of mindfulness; a paper by Luk, Holman, and Washington (2008) suggested people of Asian-American heritage may be more likely to be 'present' and non-judgemental than their American peers. Further, research suggests there may be culture variations in how resilience is manifest. A paper by Nicely (2019) suggested people of individualistic and collectivist cultures responded in different ways on the Brief Resilience Scale; indicating there may be cultural differences in how individuals exhibit resilience traits. Research focusing on

ethnically diverse samples would enable us to better understand whether cultural differences exist regarding the relationships between mindfulness, resilience, and psychological health. Lastly, future research should aim to replicate the findings of the present study to increase our confidence in the results obtained.

A number of strengths were evident in our study. It employed a substantial sample size which gave us greater confidence in our findings and it is the first that we are aware of to look at the specific contribution of each of the facets of resilience to the relationship between mindfulness and psychological distress. Focussing on the specific facets of resilience gives us a more nuanced understanding of this construct and helps to avoid erroneously treating resilience as a homogenous construct. Furthermore, it enables us to focus on the aspects of resilience that are particularly relevant for psychological health and wellbeing.

### **Conclusion**

This study raised some important questions about the nature of resilience its relationship to mindfulness. We found evidence suggesting that resilience is potentially a major pathway for mindfulness and its relationship to both psychological distress and satisfaction with life. Importantly, we found evidence supporting the notion that specific facets of resilience, particularly those related to self-perception, are more important for psychological health. Previously, people have tended to treat resilience in research as a single-factor construct. Our research suggests it is more appropriate to discuss resilience in terms of its specific facets as resilience as a construct represents a conglomerate of facets with unique contributions to psychological health. These results will hopefully encourage other researchers to continue efforts to better understand resilience by conducting research which addresses the contributions of resilience at the individual facet level and how these facets can be enhanced.

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Table 1

*Descriptive Statistics and Pearson's Correlation Coefficients*

Measure	1	2	3	4	5	6	7	8	9	10
1. Mindfulness	(.92)									
2. Distress	-.52*	(.93)								
3. Life Satisfaction	.37*	-.42*	(.88)							
4. Resilience	.63*	-.63*	.56*	(.92)						
5. R. Perception of Self	.70*	-.59*	.50*	.78*	(.92)					
6. R. Planned Future	.49*	-.51*	.53*	.78*	.60*	(.84)				
7. R. Social Competence	.45*	-.42*	.31*	.66*	.48*	.33*	(.79)			
8. R. Family Cohesion	.34*	-.38*	.36*	.72*	.41*	.41*	.36*	(.88)		
9. Social Resources	.41*	-.50*	.42*	.78*	.50*	.46*	.52*	.68*	(.85)	
10. Structured Style	.30*	-.32*	.26*	.56*	.33*	.47*	.20*	.23*	.28*	(.63)
<i>M</i>	3.25	70.76	25.10	5.25	4.89	5.38	4.94	5.33	5.97	4.95
<i>SD</i>	0.50	21.80	6.18	0.83	1.19	1.25	1.13	1.24	0.92	1.22

*Note.* The diagonal represents Cronbach's alpha values in brackets

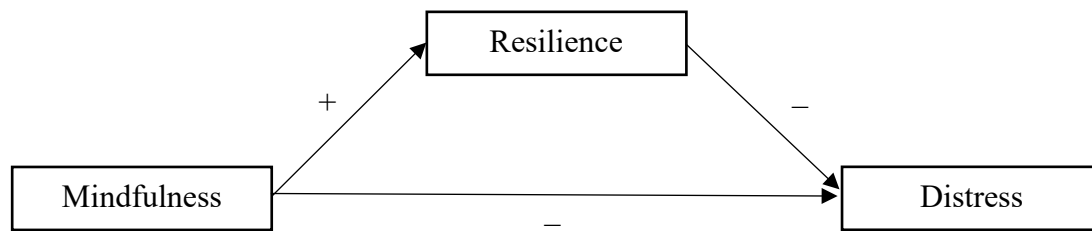
\* $p < .001$

R. = Resilience facet within the Resilience Scale for Adults (RSA)

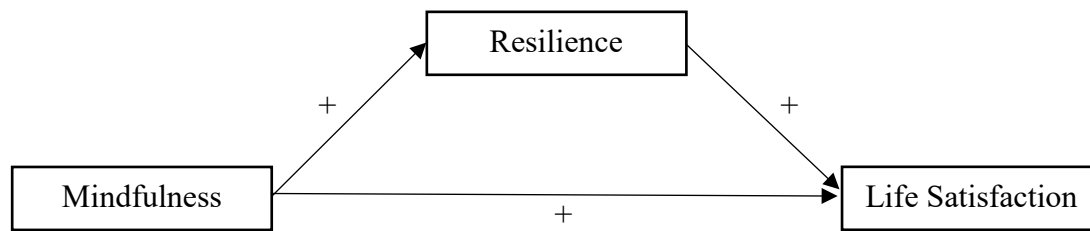
Table 2

*Specific Facets of Resilience as Mediators: Standardized Path Coefficients ( $\beta$ ) and Amount of Variance Explained ( $R^2$ )*

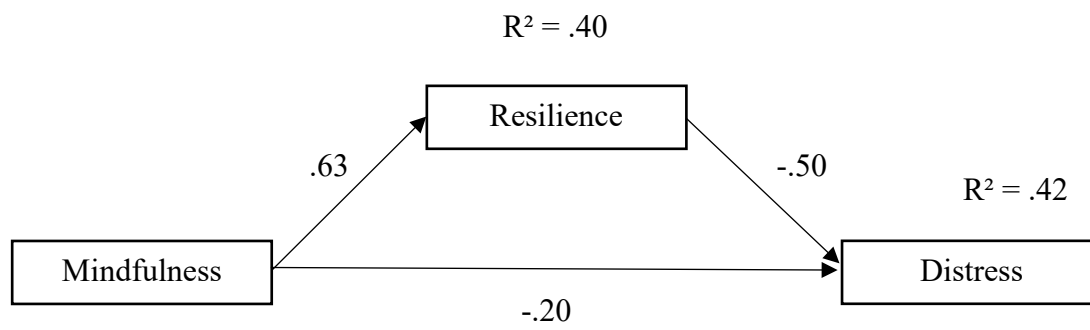
	Distress		Satisfaction with Life	
	$\beta$	$R^2$	$\beta$	$R^2$
Perception of Self	-.32	.37	.34	.25
Planned Future	-.16	.35	.23	.30
Social Competence	-.10	.31	.08	.16
Family Cohesion	-.08	.31	.09	.20
Social Resources	-.14	.37	.14	.22
Structured Style	-.06	.30	.05	.16



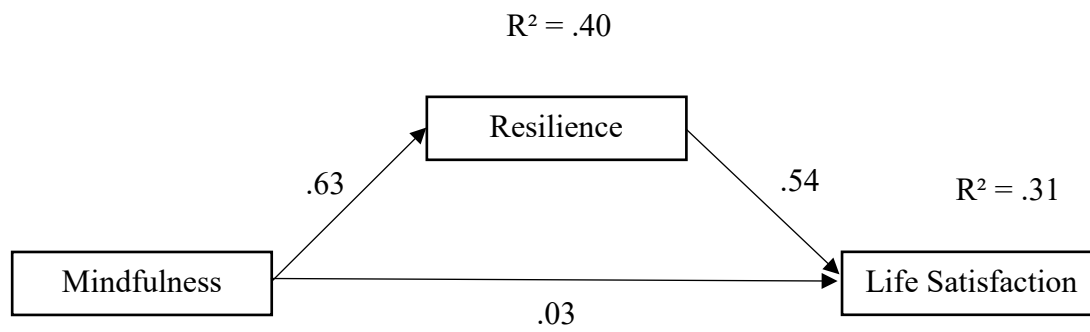
**Figure 1.** The proposed mediation model for the outcome of distress



**Figure 2.** The proposed mediation model for the outcome of life satisfaction



**Figure 3.** The observed partial-mediation model for the outcome of distress with  $R^2$  values for mindfulness' relationships with resilience and distress



**Figure 4.** The observed full-mediation model for life satisfaction with  $R^2$  values for mindfulness' relationships with resilience and life satisfaction

## Appendix A: Ethics Approval

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<b>Variation to Approved Research Submission</b>																												
Page 1																												
<b>Human Research Ethics Committee</b>  <b>Variation to Approved Research Submission</b> <div style="float: right; text-align: right;">  </div>																												
<b>Protocol</b>  <b>Chief Investigator / Project Supervisor:</b> Wilkinson, Ross  <b>Protocol:</b> Attachment working models and psychological health: The mediating roles of selected positive psychology constructs.  <b>HREC Reference No:</b> H-2014-0210																												
<b>1. Protocol Status</b>  * Has the project commenced? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  * Are you registering an approval from an External Human Research Ethics Committee (HREC) for a Variation to an existing project? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No  <b>2. Protocol Personnel</b>  * Does the variation involve changes to the research personnel working on the project? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  * Are you adding research personnel or assigning new roles? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  <i>If an existing member of the research team is to take over from you as Chief Investigator, or Project Supervisor in the case of student research, answer YES to this question.</i>  * Is someone leaving the research team? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  <b>Personnel to be added or whose role has changed</b> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; font-size: small;">* Name:</th> <th style="text-align: left; font-size: small;">* Start Date: (dd-mm-yy)</th> <th style="text-align: left; font-size: small;">* Role:</th> <th style="text-align: left; font-size: small;">* New personnel contribution to project (activities and qualification):</th> </tr> </thead> <tbody> <tr> <td>Purcell, Stuart <b>Employee/Student ID:</b> SPP201</td> <td>15-Apr-2018</td> <td>Student Researcher</td> <td>data analysis, Bachelor of Psychology (Honours)</td> </tr> <tr> <td>Wang, Yishu <b>Employee/Student ID:</b> c3297596</td> <td>15-Apr-2018</td> <td>Student Researcher</td> <td>Data analysis, Bachelor of Psychology (Honours)</td> </tr> </tbody> </table> <b>Personnel no longer active on project</b> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; font-size: small;">* Name:</th> <th style="text-align: left; font-size: small;">* Date left project: (dd-mm-yy)</th> <th style="text-align: left; font-size: small;">* Briefly state reasons for leaving project:</th> </tr> </thead> <tbody> <tr> <td>Marissa Black</td> <td>31-Dec-2017</td> <td>Degree completed</td> </tr> <tr> <td>Alexandra Arentz</td> <td>31-Dec-2018</td> <td>Degree completed</td> </tr> <tr> <td>Madeline Begg</td> <td>31-Dec-2018</td> <td>Degree completed</td> </tr> <tr> <td>Callie Buller</td> <td>31-Dec-2018</td> <td>Degree completed</td> </tr> </tbody> </table> <b>Research Personnel Not Listed</b>  * Of the people to be added to the research team, was there someone who was not in the picklist? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		* Name:	* Start Date: (dd-mm-yy)	* Role:	* New personnel contribution to project (activities and qualification):	Purcell, Stuart <b>Employee/Student ID:</b> SPP201	15-Apr-2018	Student Researcher	data analysis, Bachelor of Psychology (Honours)	Wang, Yishu <b>Employee/Student ID:</b> c3297596	15-Apr-2018	Student Researcher	Data analysis, Bachelor of Psychology (Honours)	* Name:	* Date left project: (dd-mm-yy)	* Briefly state reasons for leaving project:	Marissa Black	31-Dec-2017	Degree completed	Alexandra Arentz	31-Dec-2018	Degree completed	Madeline Begg	31-Dec-2018	Degree completed	Callie Buller	31-Dec-2018	Degree completed
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**3. Funding**

As part of the Variation, are you seeking to link this ethics approval to a new research grant or other source of funding? ☐ Yes ☒ No

**4. Other Variations**

• Does the variation involve any other changes to the approved protocol? ☒ Yes ☐ No

What are the changes affecting?

If necessary, refer back to your Initial submission for what each of the following involves.

Yes ☐ No ☒ Type of research

Yes ☐ No ☒ Research population

Yes ☐ No ☒ Research methods / techniques

Yes ☐ No ☒ Consent process

Yes ☐ No ☒ Research sites

Yes ☐ No ☒ Participant numbers

Yes ☐ No ☒ Participant selection and/or recruitment

Yes ☐ No ☒ Analysis and reporting

Yes ☐ No ☒ Storage, access and disposal of data

Yes ☐ No ☒ Study documentation, eg information/consent, advertisements, surveys, etc

Yes ☒ No ☐ Other aspects not covered above

Summary of proposed variation(s).

Using Plain English and point form, provide a brief description of the proposed variation(s). Where appropriate, present in terms of from the existing protocol to the new protocol.

Extension of Protocol by 12 months

**4.1. Reason for Variation**

• Why is the variation necessary?

Secondary data analysis is incomplete and will be completed over the next 12 months.

This text box has a limit of 2,000 characters. If your response is longer than that please upload as an attachment.

**4.2. Ethical Considerations**

• What ethical considerations, if any, are raised by the proposed variation(s)? (Refer to the [National Statement on Ethical Conduct in Human Research](#))

Nil

**Page 3****5. Supporting Documents**

Any supporting documents that are new or revised as a result of the variation must be **uploaded** with this submission, eg advertisements, participant information sheets, surveys, clinical protocols. Instructions for uploading documents are given in the next section, 'Steps to complete this submission'.

**For revised documents, highlight changes and update the Version No, and Date.**

Which documents are new or revised?

- ☐ Participant Information Statement(s)
- ☐ Verified translations of Participant Information Statement(s)
- ☐ Participant Consent Form(s)
- ☐ Recruitment material, eg advertisements, posters
- ☐ Surveys / questionnaires
- ☐ Focus group / Interview schedule(s)
  
- ☐ Clinical Protocol (clinical trials only)
- ☐ Investigator's Drug Brochure (clinical trials only)
- ☐ Sponsor's indemnification (clinical trials only)

The following applies only if the project is funded and the funding **will not** be administered by the University of Newcastle:

- ☐ New grant application / funding document

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## 7. Declaration

In making this submission, I declare that:

- The research protocol conforms to the *National Statement on Ethical Conduct in Human Research, 2007*, which I have read.
- The variation(s) will not be implemented prior to receiving written authorisation from the lead Human Research Ethics Committee.
- I make this application on the basis that the information it contains is confidential and will be used by the University of Newcastle for the purposes of ethical review and monitoring of the research project described herein, and to satisfy reporting requirements to regulatory bodies. The information will not be used for any other purpose without my prior consent.

\* Each new member of the research team is being added to this project with his/her knowledge and consent and I have made them aware of the requirement for the research to be conducted according to the approved protocol.

☒ Yes ☐ No

\* I have completed all requirements for this submission. ☒

**Chief Investigator / Project Supervisor:** Wilkinson, Ross

Date: 20-Mar-2018

Please don't forget to **SAVE** before ticking 'Complete' or closing the eform

Form published 04 December 2015

## **Appendix B: Participant Information Form (General Public)**

### **Participant Information Statement – Anonymous Survey**

#### **Information Statement for the Research Project: General public version**

**This information will appear at the start of the survey.**

### **How do interpersonal relationships affect our attitudes, beliefs, and psychological health?**

Thank you for checking out our survey. Before you start the survey there are some thing you need to know.

#### ***Who is running this survey?***

This survey is part of research being conducted by Associate Professor Ross Wilkinson from the School of Psychology at the University of Newcastle with assistance from a number of postgraduate students.

#### ***Why is the research being done?***

The purpose of the research is to help us better understand how attitudes and beliefs about relationships, stress, and coping strategies are related to our psychological health and wellbeing.

#### ***Who can participate in the research?***

You need to be at least 18 years of age and live in Australia in order to do the survey.

#### ***What would I have to do?***

If you agree to participate, you will be asked to complete an online survey which involves a number of different questionnaires. The questionnaires ask about, among other things, your attitudes to close relationships, how grateful or appreciative you may feel about different things, how you cope with stress in your life, and how stressed or depressed you might be feeling.

#### ***What do I get out of it?***

Besides learning more about yourself and how psychology research is done in this area, you will receive a \$10 Amazon online voucher for participating in the research. If you decide you don't want the voucher then that's okay too, you can still complete the survey.

#### ***What choices do I have?***

Participation in this research is entirely your choice. Only those people who give their informed consent will be included in the project. Whether or not you decide to participate, your decision will not disadvantage you. If you do decide to participate, you may withdraw from the project at any time prior to submitting your completed survey. Please note that due to the anonymous nature of the survey, you will not be able to withdraw your response after it has been submitted.

#### ***How much time will it take?***

The questionnaire/survey should take approximately 40-50 minutes complete.

#### ***Are there any risks in participating?***

Although it is unlikely to cause you distress, some of the content of the survey is sensitive in nature. Some of the questions ask about interpersonal relationships, your thoughts and feelings about yourself and others, and whether you have feelings of depression and/or anxiety. Should you find any of the questions upsetting you can withdraw from the project at any time. You can also contact Lifeline on 131114 or beyondblue on 1300 22 4636 (or [www.beyondblue.org.au](http://www.beyondblue.org.au)) should you wish to seek support regarding any of the issues raised within the questionnaire/survey.

*How will my privacy be protected?*

The answers you give to the survey questions will be stored securely on password protected computers and files that only the researchers will have access to. Due to the anonymous nature of the survey the responses you provide will not be able to be linked back to you.

*How will the information collected be used?*

The collected data will contribute towards postgraduate theses and may be presented in academic publications or conferences. Non-identifiable data may be also be shared with other parties to encourage scientific scrutiny and to contribute to further research and public knowledge, or as required by law. A summary of the results will be made available on the RAPH Lab website (address to be determined). Individual participants will not be named or identified in any reports arising from the project. **The data collected will be destroyed after 5 years and only summary data kept.**

*What do I need to do to participate?*

If you want to do the survey please click on the 'Next' button below and it will take you to a page that asks you to confirm that you have read and understood the information we have given you.

If there is anything you do not understand, or you have questions, please contact the researchers before starting the survey.

*Further information*

After you finish the survey you will be given some more information about the research including reminders about who to contact if you have any concerns or issues about the research.

If you would like further information before doing the survey then please contact Dr Ross Wilkinson (Ross.Wilkinson@newcastle.edu.au).

**A/Prof Ross Wilkinson**

*Complaints about this research*

This project has been approved by the University's Human Research Ethics Committee, **Approval No. H-[insert the protocol reference number which will be identified in the written acknowledgement of your application]**.

Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to the Human Research Ethics Officer, Research Office, The Chancellery, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone (02) 49216333, email [Human-Ethics@newcastle.edu.au](mailto:Human-Ethics@newcastle.edu.au).



## **Appendix C: Participant Information Form (Student Version)**

### **Participant Information Statement – Anonymous Survey**

#### **Information Statement for the Research Project: UoN Psychology students version**

**This information will appear at the start of the survey.**

### **How do interpersonal relationships affect our attitudes, beliefs, and psychological health?**

Thank you for checking out our survey. Before you start the survey there are some thing you need to know.

#### ***Who is running this survey?***

This survey is part of research being conducted by Associate Professor Ross Wilkinson from the School of Psychology at the University of Newcastle with assistance from a number of postgraduate students.

#### ***Why is the research being done?***

The purpose of the research is to help us better understand how attitudes and beliefs about relationships, stress, and coping strategies are related to our psychological health and wellbeing.

#### ***Who can participate in the research?***

You need to be at least 18 years of age and live in Australia in order to do the survey.

#### ***What would I have to do?***

If you agree to participate, you will be asked to complete an online survey which involves a number of different questionnaires. The questionnaires ask about, among other things, your attitudes to close relationships, how grateful or appreciative you may feel about different things, how you cope with stress in your life, and how stressed or depressed you might be feeling.

#### ***What do I get out of it?***

Besides learning more about yourself and how psychology research is done in this area, if you are a Psychology student at the University of Newcastle you will receive 10 research participation points for completing the survey.

#### ***What choices do I have?***

Participation in this research is entirely your choice. Only those people who give their informed consent will be included in the project. Whether or not you decide to participate, your decision will not disadvantage you. If you do decide to participate, you may withdraw from the project at any time prior to submitting your completed survey. Please note that due to the anonymous nature of the survey, you will not be able to withdraw your response after it has been submitted.

#### ***How much time will it take?***

The questionnaire/survey should take approximately 40-50 minutes complete.

#### ***Are there any risks in participating?***

Although it is unlikely to cause you distress, some of the content of the survey is sensitive in nature. Some of the questions ask about interpersonal relationships, your thoughts and feelings about yourself and others, and whether you have feelings of depression and/or anxiety. Should you find any of the questions upsetting you can withdraw from the project at any time. You can also contact Lifeline on 131114, or you can contact the University of Newcastle Counselling Service on 49 215801 should you wish to seek support regarding any of the issues raised within the questionnaire/survey.

*How will my privacy be protected?*

The answers you give to the survey questions will be stored securely on password protected computers and files that only the researchers will have access to. Due to the anonymous nature of the survey/questionnaire the responses you provide will not be able to be linked back to you.

*How will the information collected be used?*

The collected data will contribute towards postgraduate theses and may be presented in academic publications or conferences. Non-identifiable data may also be shared with other parties to encourage scientific scrutiny and to contribute to further research and public knowledge, or as required by law. A summary of the results will be made available on the RAPH Lab website (address to be determined). Individual participants will not be named or identified in any reports arising from the project. **The data collected will be destroyed after 5 years and only summary data kept.**

*What do I need to do to participate?*

If you want to do the survey please click on the 'Next' button below and it will take you to a page that asks you to confirm that you have read and understood the information we have given you.

If there is anything you do not understand, or you have questions, please contact the researchers before starting the survey.

*Further information*

After you finish the survey you will be given some more information about the research including reminders about who to contact if you have any concerns or issues about the research.

If you would like further information before doing the survey then please contact Dr Ross Wilkinson (Ross.Wilkinson@newcastle.edu.au).

**A/Prof Ross Wilkinson**

*Complaints about this research*

This project has been approved by the University's Human Research Ethics Committee, **Approval No. H-[insert the protocol reference number which will be identified in the written acknowledgement of your application]**.

Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to the Human Research Ethics Officer, Research Office, The Chancellery, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone (02) 49216333, email [Human-Ethics@newcastle.edu.au](mailto:Human-Ethics@newcastle.edu.au).

## Appendix D: Five Facet Mindfulness Questionnaire (FFMQ)

### Five Facet Mindfulness Questionnaire

Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment, 13*, 27-45.

#### Description:

This instrument is based on a factor analytic study of five independently developed mindfulness questionnaires. The analysis yielded five factors that appear to represent elements of mindfulness as it is currently conceptualized. The five facets are observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience. More information is available in:

Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you.

1	2	3	4	5
never or very rarely true	rarely true	sometimes true	often true	Very often or always true

- \_\_\_\_\_ 1. When I'm walking, I deliberately notice the sensations of my body moving.
- \_\_\_\_\_ 2. I'm good at finding words to describe my feelings.
- \_\_\_\_\_ 3. I criticize myself for having irrational or inappropriate emotions.
- \_\_\_\_\_ 4. I perceive my feelings and emotions without having to react to them.
- \_\_\_\_\_ 5. When I do things, my mind wanders off and I'm easily distracted.
- \_\_\_\_\_ 6. When I take a shower or bath, I stay alert to the sensations of water on my body.
- \_\_\_\_\_ 7. I can easily put my beliefs, opinions, and expectations into words.
- \_\_\_\_\_ 8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.
- \_\_\_\_\_ 9. I watch my feelings without getting lost in them.
- \_\_\_\_\_ 10. I tell myself I shouldn't be feeling the way I'm feeling.
- \_\_\_\_\_ 11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.
- \_\_\_\_\_ 12. It's hard for me to find the words to describe what I'm thinking.
- \_\_\_\_\_ 13. I am easily distracted.
- \_\_\_\_\_ 14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.
- \_\_\_\_\_ 15. I pay attention to sensations, such as the wind in my hair or sun on my face.
- \_\_\_\_\_ 16. I have trouble thinking of the right words to express how I feel about things
- \_\_\_\_\_ 17. I make judgments about whether my thoughts are good or bad.
- \_\_\_\_\_ 18. I find it difficult to stay focused on what's happening in the present.



- \_\_\_\_\_ 19. When I have distressing thoughts or images, I “step back” and am aware of the thought or image without getting taken over by it.
- \_\_\_\_\_ 20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.
- \_\_\_\_\_ 21. In difficult situations, I can pause without immediately reacting.
- \_\_\_\_\_ 22. When I have a sensation in my body, it’s difficult for me to describe it because I can’t find the right words.
- \_\_\_\_\_ 23. It seems I am “running on automatic” without much awareness of what I’m doing.
- \_\_\_\_\_ 24. When I have distressing thoughts or images, I feel calm soon after.
- \_\_\_\_\_ 25. I tell myself that I shouldn’t be thinking the way I’m thinking.
- \_\_\_\_\_ 26. I notice the smells and aromas of things.
- \_\_\_\_\_ 27. Even when I’m feeling terribly upset, I can find a way to put it into words.
- \_\_\_\_\_ 28. I rush through activities without being really attentive to them.
- \_\_\_\_\_ 29. When I have distressing thoughts or images I am able just to notice them without reacting.
- \_\_\_\_\_ 30. I think some of my emotions are bad or inappropriate and I shouldn’t feel them.
- \_\_\_\_\_ 31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.
- \_\_\_\_\_ 32. My natural tendency is to put my experiences into words.
- \_\_\_\_\_ 33. When I have distressing thoughts or images, I just notice them and let them go.
- \_\_\_\_\_ 34. I do jobs or tasks automatically without being aware of what I’m doing.
- \_\_\_\_\_ 35. When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about.
- \_\_\_\_\_ 36. I pay attention to how my emotions affect my thoughts and behavior.
- \_\_\_\_\_ 37. I can usually describe how I feel at the moment in considerable detail.
- \_\_\_\_\_ 38. I find myself doing things without paying attention.
- \_\_\_\_\_ 39. I disapprove of myself when I have irrational ideas.

### Appendix E: Resilience Scale for Adults (RSA)

#### Resilience Scale for Adults

Please think of how you usually are, or how you have been the last month, how you think and feel about yourself, and about important people surrounding you. Please check the option box that is closest to the end statement that describes you best.

© Developed by Odin Hjemdal & Oddgeir Friborg

Name: \_\_\_\_\_ Todays date: \_\_\_\_\_

Age: \_\_\_\_\_ Gender: \_\_\_\_\_ female/male

1. When something unforeseen happens	I often feel bewildered	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	I always find a solution
2. My plans for the future are	difficult to accomplish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	possible to accomplish
3. I enjoy being	together with other people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	by myself
4. My family's understanding of what is important in life is	quite different	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	very similar
5. I can discuss personal issues with	no one	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	friends/family-members
6. I am at my best when I	have a goal to strive for	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	can take one day at a time
7. My personal problems	I know how to solve	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	I can not find any solutions for
8. I feel that my future looks	very promising	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	uncertain
9. To be flexible in social settings	is not important to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	is really important to me
10. I feel	very happy with my family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	very unhappy with my family
11. Those who are good at encouraging me are	some close friends/family members	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	no one
12. When I start on new things/projects	I rarely plan ahead, just get on with it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	I prefer to have a plan
13. My judgements and decisions	I often doubt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	I trust completely
14. My goals	I know how to accomplish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	I am unsure how to accomplish
15. New friendships are something	I make easily	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	I have difficulty making
16. My family is characterized by	disconnection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	healthy cohesion
17. The bonds among my friends is	weak	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	strong
18. I am good at	organizing my time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	wasting my time
19. Belief in myself	gets me through difficult periods	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	is of little help in difficult periods
20. My goals for the future are	unclear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	well thought through
21. Meeting new people is	difficult for me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	something I am good at

[illegible]

**Appendix F: Depression, Anxiety, and Stress Scale – 21 Item (DASS21)****Reference for the DASS-21:**

Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the Depression Anxiety Stress Scales. (2<sup>nd</sup> Ed.)*  
 Sydney: Psychology Foundation. ISBN 7334-1423-0

**DASS<sub>21</sub>**

Name:

Date:

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

*The rating scale is as follows:*

- 0 Did not apply to me at all
- 1 Applied to me to some degree, or some of the time
- 2 Applied to me to a considerable degree, or a good part of time
- 3 Applied to me very much, or most of the time

1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (eg, in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical	0	1	2	3

exertion (eg, sense of heart rate increase, heart missing a beat)				
20	I felt scared without any good reason	0	1	2 3
21	I felt that life was meaningless	0	1	2 3

**Appendix G: Satisfaction with Life Scale (SWLS)**

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, A. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment*, 49, 71-75.

Below are five statements that you may agree or disagree with. Using the 1 - 7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding.

- 7 - Strongly agree
- 6 - Agree
- 5 - Slightly agree
- 4 - Neither agree nor disagree
- 3 - Slightly disagree
- 2 - Disagree
- 1 - Strongly disagree

\_\_\_\_ In most ways my life is close to my ideal.

\_\_\_\_ The conditions of my life are excellent.

\_\_\_\_ I am satisfied with my life.

\_\_\_\_ So far I have gotten the important things I want in life.

\_\_\_\_ If I could live my life over, I would change almost nothing.

### **Appendix H: Scope of Journal**

*Mindfulness* Journal Advances research, clinical practice, and theory on mindfulness

- Offers the single scholarly source dedicated to mindfulness theory and multidisciplinary scholarly research, including assessment, prevention, treatment, consultation, training, and collaboration
- Is supported by an editorial board that is composed of a highly qualified and experienced multidisciplinary team of experts in mindfulness
- Helps define and advance the science and practice of mindfulness

This journal publishes peer-reviewed papers that examine the latest research findings and best practices in mindfulness. It explores the nature and foundations of mindfulness, its mechanisms of actions, and its use across cultures. In addition, *Mindfulness* features papers that address issues involving the training of clinicians, institutional staff, teachers, parents, and industry personnel in mindful provision of services.

Coverage in the journal includes reliability and validity of assessment of mindfulness; clinical uses of mindfulness in psychological distress, psychiatric disorders, and medical conditions; alleviation of personal and societal suffering; the nature and foundations of mindfulness; mechanisms of action; and the use of mindfulness across cultures.

*Mindfulness* features diverse viewpoints, including psychology, psychiatry, medicine, neurobiology, psychoneuroendocrinology, cognitive, behavioral, cultural, philosophy, spirituality, and wisdom traditions. It serves as a much-needed forum for the broad-based, leading-edge research in this burgeoning field.

## **Appendix I: Journal Submission Requirements**

Retrieved 7<sup>th</sup> of October, 2019 from:

<https://www.springer.com/psychology/cognitive+psychology/journal/12671>

### **Instructions for Authors**

#### **Editorial procedure**

##### **Double-blind peer review**

This journal follows a double-blind reviewing procedure. Authors are therefore requested to submit:

- A blinded manuscript without any author names and affiliations in the text or on the title page. Self-identifying citations and references in the article text should be avoided.
- A separate title page, containing title, all author names, affiliations, and the contact information of the corresponding author. Any acknowledgements, disclosures, or funding information should also be included on this page.

### **Manuscript Submission**

Submission of a manuscript implies: that the work described has not been published before; that it is not under consideration for publication anywhere else; that its publication has been approved by all co-authors, if any, as well as by the responsible authorities – tacitly or explicitly – at the institute where the work has been carried out. The publisher will not be held legally responsible should there be any claims for compensation.

### **Permissions**

Authors wishing to include figures, tables, or text passages that have already been published elsewhere are required to obtain permission from the copyright owner(s) for both the print and online format and to include evidence that such permission has been granted when submitting their papers. Any material received without such evidence will be assumed to originate from the authors.

### **Online Submission**

Please follow the hyperlink “Submit online” on the right and upload all of your manuscript files following the instructions given on the screen.

Please ensure you provide all relevant editable source files. Failing to submit these source files might cause unnecessary delays in the review and production process.

### **Suggested Reviewers**

Authors of research and review papers, excluding editorial and book review submissions, are allowed to provide the names and contact information for, maximum, 4 to 6 possible reviewers of their paper. When uploading a paper to the Editorial Manager site, authors must provide complete contact information for each recommended reviewer, along with a specific reason for your suggestion in the comments box for each person. The journal will consider reviewers recommended by the authors only if the reviewers’ institutional email is provided. A minimum



of two suggested reviewers should be from a university or research institute in the United States. You may not suggest the Editor or Associate Editors of the journal as potential reviewers. Although there is no guarantee that the editorial office will use your suggested reviewers, your help is appreciated and may speed up the selection of appropriate reviewers.

Authors should note that it is inappropriate to list as preferred reviewers researchers from the same institution as any of the authors, collaborators and co-authors from the past five years as well as anyone whose relationship with one of the authors may present a conflict of interest. The journal will not tolerate this practice and reserves the right to reject submissions on this basis.

### **Title Page**

The title page should include:

- The name(s) of the author(s)
- A concise and informative title
- The affiliation(s) and address(es) of the author(s)
- The e-mail address, and telephone number(s) of the corresponding author
- If available, the 16-digit ORCID of the author(s)

### **Abstract**

Please provide of structured abstract of up to 250 words

Keywords

Please provide 4 to 6 keywords which can be used for indexing purposes.

Structured Abstract

The structured abstract of up to 250 words with four labeled sections should containing the following, with sub-section headers in bold:

- a. Objectives: Problem being addressed in the study
- b. Methods: The participants, essential features of the study method
- c. Results: The basic findings, including effect sizes and confidence intervals and/or statistical significance levels
- d. Conclusions: What the authors conclude from study results

### **Text**

#### **Text Formatting**

Manuscripts should be submitted in Word.

Use a normal, plain font (e.g., 12-point Times Roman) for text.

Use italics for emphasis.

Use the automatic page numbering function to number the pages.

Do not use field functions.

Use tab stops or other commands for indents, not the space bar.

Use the table function, not spreadsheets, to make tables.

Use the equation editor or MathType for equations.

Save your file in docx format (Word 2007 or higher) or doc format (older Word versions).

## **Headings**

Please use no more than three levels of displayed headings.

### **Abbreviations**

Abbreviations should be defined at first mention and used consistently thereafter.

## **Acknowledgments**

Acknowledgments of people, grants, funds, etc. should be placed in a separate section on the title page. The names of funding organizations should be written in full.

## **Footnotes**

This journal does not allow the use of footnotes, except in reprinted papers.

## **Article length**

Papers accepted for publication in this journal are 35 double-spaced pages, in 12-point font, inclusive of text, references, tables and figures. For manuscripts exceeding this length, authors should contact the Editor in Chief, Nirbhay N. Singh directly at nirbz52@gmail.com.

## **Terminology**

- Please always use internationally accepted signs and symbols for units (SI units).

## **Scientific style**

- Generic names of drugs and pesticides are preferred; if trade names are used, the generic name should be given at first mention.
- Please use the standard mathematical notation for formulae, symbols etc.:

Italic for single letters that denote mathematical constants, variables, and unknown quantities

Roman/upright for numerals, operators, and punctuation, and commonly defined functions or abbreviations, e.g., cos, det, e or exp, lim, log, max, min, sin, tan, d (for derivative)

Bold for vectors, tensors, and matrices.

## **References**

### **Citation**

Cite references in the text by name and year in parentheses. Some examples:

- Negotiation research spans many disciplines (Thompson 1990).
- This result was later contradicted by Becker and Seligman (1996).
- This effect has been widely studied (Abbott 1991; Barakat et al. 1995; Kelso and Smith 1998; Medvec et al. 1999).

Ideally, the names of six authors should be given before et al. (assuming there are six or more), but names will not be deleted if more than six have been provided.

### Reference list

The list of references should only include works that are cited in the text and that have been published or accepted for publication. Personal communications and unpublished works should only be mentioned in the text. Do not use footnotes or endnotes as a substitute for a reference list.

Reference list entries should be alphabetized by the last names of the first author of each work.

Journal names and book titles should be *italicized*.

- Journal article

Harris, M., Karper, E., Stacks, G., Hoffman, D., DeNiro, R., Cruz, P., et al. (2001). Writing labs and the Hollywood connection. *Journal of Film Writing*, 44(3), 213–245.

- Article by DOI

Slifka, M. K., & Whitton, J. L. (2000) Clinical implications of dysregulated cytokine production. *Journal of Molecular Medicine*, <https://doi.org/10.1007/s001090000086>

- Book

Calfee, R. C., & Valencia, R. R. (1991). *APA guide to preparing manuscripts for journal publication*. Washington, DC: American Psychological Association.

- Book chapter

O'Neil, J. M., & Egan, J. (1992). Men's and women's gender role journeys: Metaphor for healing, transition, and transformation. In B. R. Wainrib (Ed.), *Gender issues across the life cycle* (pp. 107–123). New York: Springer.

- Online document

Abou-Allaban, Y., Dell, M. L., Greenberg, W., Lomax, J., Peteet, J., Torres, M., & Cowell, V. (2006). Religious/spiritual commitments and psychiatric practice. Resource document. American Psychiatric Association. [http://www.psych.org/edu/other\\_res/lib\\_archives/archives/200604.pdf](http://www.psych.org/edu/other_res/lib_archives/archives/200604.pdf). Accessed 25 June 2007.

For authors using EndNote, Springer provides an output style that supports the formatting of in-text citations and reference list.

- EndNote style (zip, 3 kB)

### Tables

- All tables are to be numbered using Arabic numerals.
- Tables should always be cited in text in consecutive numerical order.
- For each table, please supply a table caption (title) explaining the components of the table.
- Identify any previously published material by giving the original source in the form of a reference at the end of the table caption.

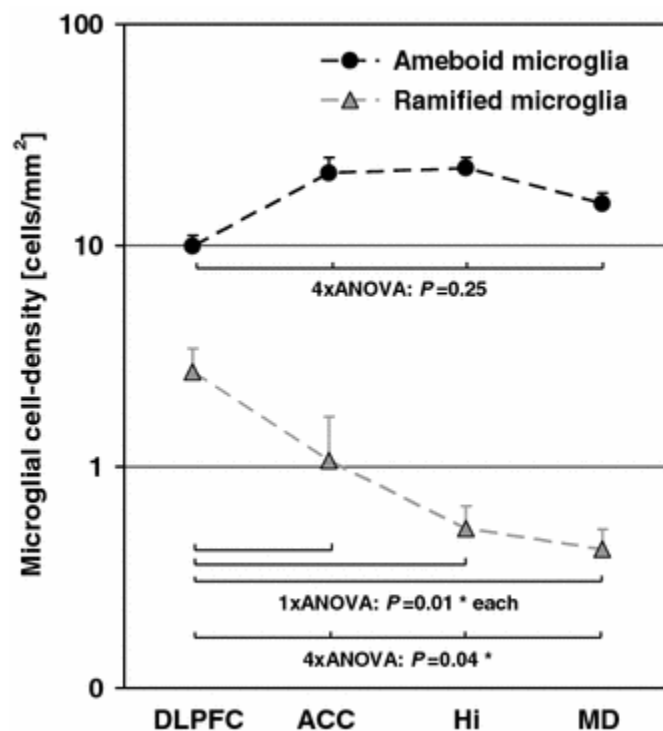
- Footnotes to tables should be indicated by superscript lower-case letters (or asterisks for significance values and other statistical data) and included beneath the table body.

### Artwork and Illustrations Guidelines

#### Electronic Figure Submission

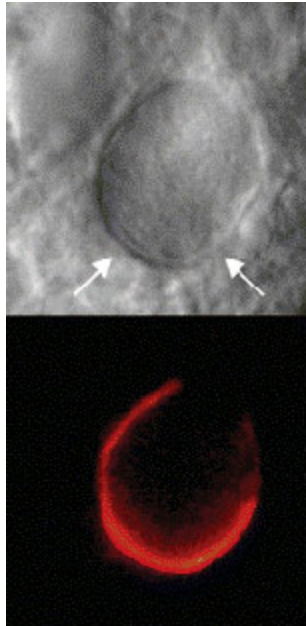
- Supply all figures electronically.
- Indicate what graphics program was used to create the artwork.
- For vector graphics, the preferred format is EPS; for halftones, please use TIFF format. MSOffice files are also acceptable.
- Vector graphics containing fonts must have the fonts embedded in the files.
- Name your figure files with "Fig" and the figure number, e.g., Fig1.eps.

#### Line Art



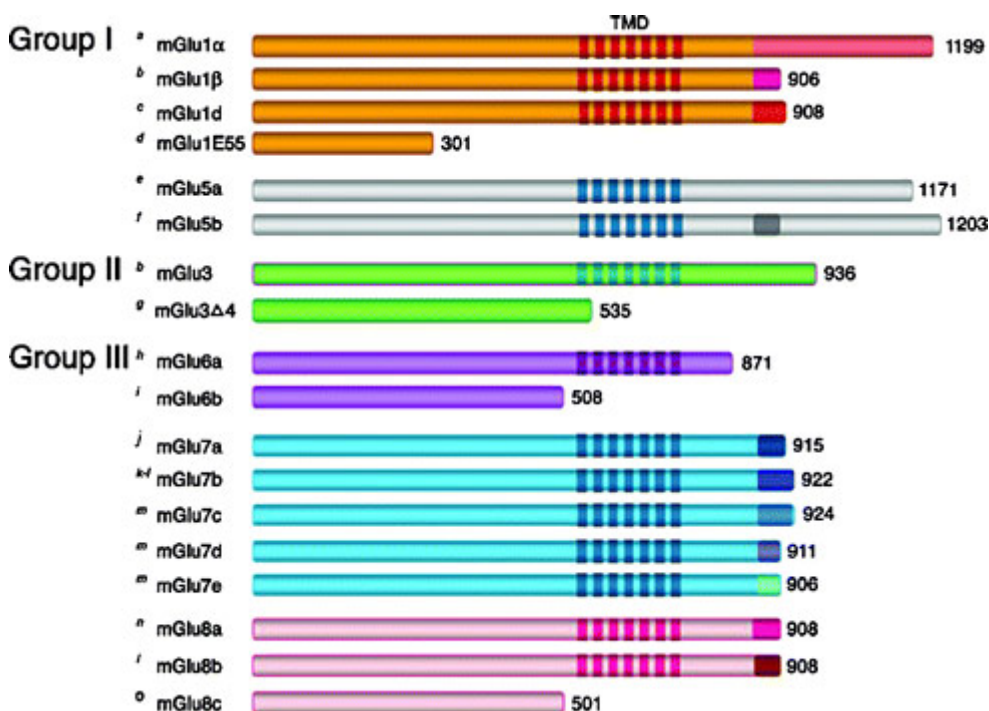
- Definition: Black and white graphic with no shading.
- Do not use faint lines and/or lettering and check that all lines and lettering within the figures are legible at final size.
- All lines should be at least 0.1 mm (0.3 pt) wide.
- Scanned line drawings and line drawings in bitmap format should have a minimum resolution of 1200 dpi.
- Vector graphics containing fonts must have the fonts embedded in the files.

#### Halftone Art



- Definition: Photographs, drawings, or paintings with fine shading, etc.
- If any magnification is used in the photographs, indicate this by using scale bars within the figures themselves.
- Halftones should have a minimum resolution of 300 dpi.

### Combination Art



- Definition: a combination of halftone and line art, e.g., halftones containing line drawing, extensive lettering, color diagrams, etc.
- Combination artwork should have a minimum resolution of 600 dpi.

### Color Art

- Color art is free of charge for online publication.
- If black and white will be shown in the print version, make sure that the main information will still be visible. Many colors are not distinguishable from one another when converted to black and white. A simple way to check this is to make a xerographic copy to see if the necessary distinctions between the different colors are still apparent.
- If the figures will be printed in black and white, do not refer to color in the captions.
- Color illustrations should be submitted as RGB (8 bits per channel).

### **Figure Lettering**

- To add lettering, it is best to use Helvetica or Arial (sans serif fonts).
- Keep lettering consistently sized throughout your final-sized artwork, usually about 2–3 mm (8–12 pt).
- Variance of type size within an illustration should be minimal, e.g., do not use 8-pt type on an axis and 20-pt type for the axis label.
- Avoid effects such as shading, outline letters, etc.
- Do not include titles or captions within your illustrations.

### **Figure Numbering**

- All figures are to be numbered using Arabic numerals.
- Figures should always be cited in text in consecutive numerical order.
- Figure parts should be denoted by lowercase letters (a, b, c, etc.).
- If an appendix appears in your article and it contains one or more figures, continue the consecutive numbering of the main text. Do not number the appendix figures,

"A1, A2, A3, etc." Figures in online appendices (Electronic Supplementary Material) should, however, be numbered separately.

### **Figure Captions**

- Each figure should have a concise caption describing accurately what the figure depicts. Include the captions in the text file of the manuscript, not in the figure file.
- Figure captions begin with the term Fig. in bold type, followed by the figure number, also in bold type.
- No punctuation is to be included after the number, nor is any punctuation to be placed at the end of the caption.
- Identify all elements found in the figure in the figure caption; and use boxes, circles, etc., as coordinate points in graphs.
- Identify previously published material by giving the original source in the form of a reference citation at the end of the figure caption.

### **Figure Placement and Size**

- Figures should be submitted separately from the text, if possible.

- When preparing your figures, size figures to fit in the column width.
- For large-sized journals the figures should be 84 mm (for double-column text areas), or 174 mm (for single-column text areas) wide and not higher than 234 mm.
- For small-sized journals, the figures should be 119 mm wide and not higher than 195 mm.

### **Permissions**

If you include figures that have already been published elsewhere, you must obtain permission from the copyright owner(s) for both the print and online format. Please be aware that some publishers do not grant electronic rights for free and that Springer will not be able to refund any costs that may have occurred to receive these permissions. In such cases, material from other sources should be used.

### **Accessibility**

In order to give people of all abilities and disabilities access to the content of your figures, please make sure that

- All figures have descriptive captions (blind users could then use a text-to-speech software or a text-to-Braille hardware)
- Patterns are used instead of or in addition to colors for conveying information (colorblind users would then be able to distinguish the visual elements)
- Any figure lettering has a contrast ratio of at least 4.5:1

### **Electronic Supplementary Material**

Springer accepts electronic multimedia files (animations, movies, audio, etc.) and other supplementary files to be published online along with an article or a book chapter. This feature can add dimension to the author's article, as certain information cannot be printed or is more convenient in electronic form.

Before submitting research datasets as electronic supplementary material, authors should read the journal's Research data policy. We encourage research data to be archived in data repositories wherever possible.

### **Submission**

- Supply all supplementary material in standard file formats.
- Please include in each file the following information: article title, journal name, author names; affiliation and e-mail address of the corresponding author.
- To accommodate user downloads, please keep in mind that larger-sized files may require very long download times and that some users may experience other problems during downloading.

### **Audio, Video, and Animations**

- Aspect ratio: 16:9 or 4:3
- Maximum file size: 25 GB
- Minimum video duration: 1 sec

- Supported file formats: avi, wmv, mp4, mov, m2p, mp2, mpg, mpeg, flv, mxf, mts, m4v, 3gp

### **Text and Presentations**

- Submit your material in PDF format; .doc or .ppt files are not suitable for long-term viability.
- A collection of figures may also be combined in a PDF file.

### **Spreadsheets**

- Spreadsheets should be submitted as .csv or .xlsx files (MS Excel).

### **Specialized Formats**

- Specialized format such as .pdb (chemical), .wrl (VRML), .nb (Mathematica notebook), and .tex can also be supplied.

### **Collecting Multiple Files**

- It is possible to collect multiple files in a .zip or .gz file.

### **Numbering**

- If supplying any supplementary material, the text must make specific mention of the material as a citation, similar to that of figures and tables.
- Refer to the supplementary files as “Online Resource”, e.g., "... as shown in the animation (Online Resource 3)", "... additional data are given in Online Resource 4”.
- Name the files consecutively, e.g. “ESM\_3.mpg”, “ESM\_4.pdf”.

### **Captions**

- For each supplementary material, please supply a concise caption describing the content of the file.

### **Processing of supplementary files**

- Electronic supplementary material will be published as received from the author without any conversion, editing, or reformatting.

### **Accessibility**

In order to give people of all abilities and disabilities access to the content of your supplementary files, please make sure that

- The manuscript contains a descriptive caption for each supplementary material
- Video files do not contain anything that flashes more than three times per second (so that users prone to seizures caused by such effects are not put at risk)

### **Integrity of research and reporting**

#### **Ethical standards**

Manuscripts submitted for publication must contain a statement to the effect that all human and animal studies have been approved by the appropriate ethics committee and have therefore



been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

It should also be stated clearly in the text that all persons gave their informed consent prior to their inclusion in the study. Details that might disclose the identity of the subjects under study should be omitted.

These statements should be added in a separate section before the reference list. If these statements are not applicable, authors should state: The manuscript does not contain clinical studies or patient data.

The editors reserve the right to reject manuscripts that do not comply with the above-mentioned requirements. The author will be held responsible for false statements or failure to fulfill the above-mentioned requirements

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Authors must indicate whether or not they have a financial relationship with the organization that sponsored the research. This note should be added in a separate section before the reference list.

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For editors and reviewers to accurately assess the work presented in your manuscript you need to ensure the English language is of sufficient quality to be understood. If you need help with writing in English you should consider:

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- A single study should not be split up into several parts to increase the quantity of submissions and submitted to various journals or to one journal over time (i.e. 'salami-slicing/publishing').
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**Important note: the journal may use software to screen for plagiarism.**

- Authors should make sure they have permissions for the use of software, questionnaires/(web) surveys and scales in their studies (if appropriate).
- Authors should avoid untrue statements about an entity (who can be an individual person or a company) or descriptions of their behavior or actions that could potentially be seen as personal attacks or allegations about that person.
- Research that may be misapplied to pose a threat to public health or national security should be clearly identified in the manuscript (e.g. dual use of research). Examples include creation of harmful consequences of biological agents or toxins, disruption of immunity of vaccines, unusual hazards in the use of chemicals, weaponization of research/technology (amongst others).
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\*All of the above are guidelines and authors need to make sure to respect third parties rights such as copyright and/or moral rights.

Upon request authors should be prepared to send relevant documentation or data in order to verify the validity of the results presented. This could be in the form of raw data, samples, records, etc. Sensitive information in the form of confidential or proprietary data is excluded.

If there is suspicion of misbehavior or alleged fraud the Journal and/or Publisher will carry out an investigation following COPE guidelines. If, after investigation, there are valid concerns, the author(s) concerned will be contacted under their given e-mail address and given an opportunity to address the issue. Depending on the situation, this may result in the Journal's and/or Publisher's implementation of the following measures, including, but not limited to:

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- If the article has already been published online, depending on the nature and severity of the infraction:
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  - an expression of concern may be placed with the article
  - or in severe cases retraction of the article may occur.

The reason will be given in the published erratum/correction, expression of concern or retraction note. Please note that retraction means that the article is **maintained on the platform**, watermarked “retracted” and the explanation for the retraction is provided in a note linked to the watermarked article.

- The author's institution may be informed
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Authors have an obligation to correct mistakes once they discover a significant error or inaccuracy in their published article. The author(s) is/are requested to contact the journal and explain in what sense the error is impacting the article. A decision on how to correct the literature will depend on the nature of the error. This may be a correction or retraction. The retraction note should provide transparency which parts of the article are impacted by the error.

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Authors are welcome to suggest suitable reviewers and/or request the exclusion of certain individuals when they submit their manuscripts. When suggesting reviewers, authors should make sure they are totally independent and not connected to the work in any way. It is strongly recommended to suggest a mix of reviewers from different countries and different institutions. When suggesting reviewers, the Corresponding Author must provide an institutional email address for each suggested reviewer, or, if this is not possible to include other means of verifying the identity such as a link to a personal homepage, a link to the publication record or a researcher or author ID in the submission letter. Please note that the Journal may not use the suggestions, but suggestions are appreciated and may help facilitate the peer review process.

### **Authorship principles**

These guidelines describe authorship principles and good authorship practices to which prospective authors should adhere to.

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The Publisher does not prescribe the kinds of contributions that warrant authorship. It is recommended that authors adhere to the guidelines for authorship that are applicable in their specific research field. In absence of specific guidelines it is recommended to adhere to the following guidelines\*:

All authors whose names appear on the submission

- 1) made substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data; or the creation of new software used in the work;
- 2) drafted the work or revised it critically for important intellectual content;
- 3) approved the version to be published; and
- 4) agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

\* Based on/adapted from:

- ICMJE, Defining the Role of Authors and Contributors,
- Transparency in authors' contributions and responsibilities to promote integrity in scientific publication, McNutt et al, PNAS February 27, 2018

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All authors are requested to include information regarding sources of funding, financial or non-financial interests, study-specific approval by the appropriate ethics committee for research involving humans and/or animals, informed consent if the research involved human participants, and a statement on welfare of animals if the research involved animals (as appropriate).

The decision whether such information should be included is not only dependent on the scope of the journal, but also the scope of the article. Work submitted for publication may have implications for public health or general welfare and in those cases it is the responsibility of all authors to include the appropriate disclosures and declarations.

### **Data transparency**

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**One author** is assigned as Corresponding Author and acts on behalf of all co-authors and ensures that questions related to the accuracy or integrity of any part of the work are appropriately addressed.

The Corresponding Author is responsible for the following requirements:

- ensuring that all listed authors have approved the manuscript before submission, including the names and order of authors;
- managing all communication between the Journal and all co-authors, before and after publication;\*
- providing transparency on re-use of material and mention any unpublished material (for example manuscripts in press) included in the manuscript in a cover letter to the Editor;
- making sure disclosures, declarations and transparency on data statements from all authors are included in the manuscript as appropriate (see above).

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Please check the Instructions for Authors of the Journal that you are submitting to for specific instructions regarding contribution statements.

In absence of specific instructions and in research fields where it is possible to describe discrete efforts, the Publisher recommends authors to include contribution statements in the work that specifies the contribution of every author in order to promote transparency. These contributions should be listed at the separate title page.

#### Examples of such statement(s) are shown below:

- Free text:

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by [full name], [full name] and [full name]. The first draft of the manuscript was written by [full name] and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

- Example: CRediT taxonomy:
- Conceptualization: [full name], ...; Methodology: [full name], ...; Formal analysis and investigation: [full name], ...; Writing - original draft preparation: [full name, ...]; Writing - review and editing: [full name], ...; Funding acquisition: [full name], ...; Resources: [full name], ...; Supervision: [full name],....

For **review articles** where discrete statements are less applicable a statement should be included who had the idea for the article, who performed the literature search and data analysis, and who drafted and/or critically revised the work.

For articles that are based primarily on the **student's dissertation or thesis**, it is recommended that the student is usually listed as principal author:

- A Graduate Student's Guide to Determining Authorship Credit and Authorship Order, APA Science Student Council 2006

**Affiliation**

The primary affiliation for each author should be the institution where the majority of their work was done. If an author has subsequently moved, the current address may additionally be stated. Addresses will not be updated or changed after publication of the article.

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Authors are strongly advised to ensure the correct author group, the Corresponding Author, and the order of authors at submission. Changes of authorship by adding or deleting authors, and/or changes in Corresponding Author, and/or changes in the sequence of authors are **not** accepted **after acceptance** of a manuscript.

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Please make sure that the names of all authors are present and correctly spelled, and that addresses and affiliations are current.

Adding and/or deleting authors at revision stage are generally not permitted, but in some cases it may be warranted. Reasons for these changes in authorship should be explained. Approval of the change during revision is at the discretion of the Editor-in-Chief. Please note that journals may have individual policies on adding and/or deleting authors during revision stage.

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Authors are recommended to use their ORCID ID when submitting an article for consideration or acquire an ORCID ID via the submission process.

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For cases in which a co-author dies or is incapacitated during the writing, submission, or peer-review process, and the co-authors feel it is appropriate to include the author, co-authors should obtain approval from a (legal) representative which could be a direct relative.

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