Eco-Generativity Scale (EGS): Un nuovo strumento per misurare l'eco-generatività

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Sommario

Le sfide ambientali sono tra le più urgenti che la società umana sta affrontando, poiché hanno rilevanti implicazioni sia per l'ambiente sia per la salute umana. In questo contesto, il costrutto di eco-generatività è stato introdotto come risposta adattativa e positiva per far evolvere la prospettiva. L'*Eco-Generativity Scale* (EGS) è uno strumento basato sul recente costrutto integrato di eco-generatività. L'EGS racchiude quattro aspetti: due forme di generatività, vale a dire la generatività ecologica e la generatività sociale, l'identità ambientale, il successo percepito nel raggiungimento degli obiettivi e nella produzione di progettuazioni di successo. La presente ricerca ha analizzato le proprietà psicometriche della *Scala dell'Ecogenerativit*à in 141 studenti universitari italiani. L'analisi parallela di Horn e l'analisi fattoriale esplorativa sono state eseguite per testare la struttura fattoriale della scala. L'alfa di Cronbach è stata calcolata per valutare l'affidabilità della scala. La validità concorrente è stata studiata con la *Satisfaction with Life Scale* (SWLS) e la *Flourishing Scale* (FS). I risultati hanno mostrato una soluzione a quattro fattori soddisfacente, che racchiude un fattore di Generatività Ecologica, un fattore di Generatività Sociale, un fattore di Identità Ambientale, un fattore di Agentività/Percorsi. Il coefficiente di affidabilità alfa di Cronbach è risultato eccellente per ogni fattore, mostrando una correlazione positiva e statisticamente significativa con SWLS e FS. L'*Eco-Generativity Scale* (EGS) rappresenta dunque uno strumento promettente per la ricerca e l'intervento in relazione al costrutto recentemente avanzato di eco-generatività per affrontare le sfide ambientali, inclusa l'eco-ansia.

Parole chiave

Eco-generatività, Eco-Generativity Scale, Benessere, Eco-ansia, Salute, Psicologia della sostenibilità e dello sviluppo sostenibile, Scienza della sostenibilità.

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The *Eco-Generativity Scale* (EGS): A New Tool to Measure Eco-Generativity

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Abstract

Environmental challenges are some of the most urgent that human society is facing, as they have far-reaching implications for both the environment and human health. In this context, the construct of eco-generativity was introduced as an adaptive and positive response to advance the perspective. The *Eco-Generativity Scale* (EGS) is an instrument based on the recently advanced integrated construct of eco-generativity. EGS encapsulates four facets: two forms of generativity, namely ecological and social generativity, as well as environmental identity and perceived success in achieving goals and generating successful plans. The present study aimed to analyse the psychometric properties of the *Eco-Generativity Scale* in 141 Italian University Students. Horn's parallel analysis and exploratory factor analysis were run to test the factor structure of the scale. Cronbach's alpha was calculated to assess reliability. Concurrent validity was investigated with the *Satisfaction with Life Scale* (SWLS) and *Flourishing Scale* (*FS*). The results showed a satisfactory four-factor solution that enclosed an Ecological Generativity factor, a Social Generativity factor, an Environmental Identity factor, and an Agency/Pathways factor. Cronbach's alpha coefficient of reliability was found to be excellent for each factor that showed a positive and statistically significant correlation with SWLS and FS. Thus, the Eco-Generativity Scale (EGS) represents a promising tool for research and intervention on the recently advanced construct of eco-generativity in coping with environmental challenges including eco-anxiety.

Keywords

Eco-generativity, Eco-Generativity Scale, Well-being. Eco-anxiety, Health, Psychology of sustainability and sustainable development, Sustainability science.

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Introduction

Environmental challenges are the most pressing issue facing human society today, with implications for both environmental and human health (Heeren & Asmundson, 2022; Morrison et al., 2022). The downstream effects of climate change include forest degradation, desertification, forest fires, and decreasing biodiversity, all of which negatively impact economic growth and human health (Watts et al., 2021). In this scenario, the concern for a sustainable future has become a worldwide scientific, political, and informative debate (Cianconi et al., 2023), and research has started emerging in applied psychology since environmental challenges and climate change also have widespread negative psychological effects (e.g., Boluda-Verdú et al., 2022). Furthermore, during recent years, scientific literature has examined the anxiety, worry, and concerns experienced by individuals in facing the challenges of climate change, advancing new terms to address these adverse psychological phenomena mainly labelled as «*eco-anxiety*» (Boluda-Verdú et al., 2022).

Eco-anxiety is a growing psychological phenomenon characterized by chronic fear of environmental doom related to climate change (Clayton et al., 2021). Researchers have developed measurement tools to investigate eco-anxiety, such as the *Climate Change Anxiety Scale* (Clayton & Karazsia, 2020) and the *Climate Change Worry Scale* (Stewart, 2021). Furthermore, a growing body of literature is providing data regarding the extent of eco-anxiety among individuals. For example, according to data from a cross-national study of adolescents, 59% were very or extremely concerned about climate change, and more than 45% had impairment in daily functioning (e.g., affecting ability to work and/or socialize) as a result of eco-anxiety (Hickman et al., 2021). Similar findings among adults (Clayton & Karazsia, 2020) and worldwide (e.g., Gibson et al., 2020; Heeren, Mouguiama-Daouda & Contreras, 2022; Massazza, Ardino & Fioravanzo, 2022; Hajek and König, 2022; Tam, Chan & Clayton, 2023) have been reported. Despite these advancements, resilience to climate change remains an unresolved critical issue in sustainability research. Therefore, in order to also address this challenge, researchers can embrace a positive-oriented perspective, focusing on the psychological resources that individuals have to cope with environmental challenges and climate change anxiety, promoting sustainability and sustainability-related processes for the health and well-being of individuals and the environment (Di Fabio & Svicher, 2023). In this perspective, eco-generativity could represent a promising and constructive proposal for coping with the challenge of environmental issues including eco-anxiety.

Eco-generativity refers to extending the concept of generativity to the natural world and passing on a healthy environment to future generations (Di Fabio & Svicher, 2023). The latter concept emerged from the scientific literature on

generativity, which has been the subject of various advancements in the last three decades, with Erikson's contributions (1963, 1968, 1974, 1980, 1982) being the crucial point. According to Erikson (1963) «generativity» is the seventh stage of personality development in contrast to stagnation. It involves establishing, guiding, and enriching the living generation and the world it inherits. In this framework, generativity refers to adults who have achieved a clear sense of self, are capable of committing to long-term relationships, and, therefore, can start to dedicate themselves to nurturing and guiding future generations (Erikson, 1963, 1968). Generativity is the ability to produce something that reflects one's mature self (a child, a book, or an idea) and to intentionally and unselfishly share it with others to promote generational continuity and produce enduring effects (Erikson, 1963, 1968).

Subsequently, scholars moved beyond the concept of a «generativity stage» and highlighted various aspects of generativity that can manifest in the individual's personality from early to late adulthood (McAdams et al., 1986, 1993). McAdams et al. (1986) view generativity as a two-step process that involves caring for future generations and leaving a legacy of oneself beyond death. In the first step, individuals create a product that extends their sense of self. In the second step, they relinquish ownership of the product and offer it to others (McAdams et al., 1986). Accordingly, McAdams and Aubin (1992) proposed a multidimensional personality construct for generativity composed of seven facets: 1) cultural demand, 2) inner desire, 3) concern for future generations, 4) belief in the goodness of humanity, 5) generative commitment, 6) generative action, and 7) narration of generativity (McAdams & Aubin, 1992). From this perspective, these seven facets can appear in early, middle, or late adulthood and are individually arranged based on various psychosocial demands (such as environmental, biological, psychological, social, and cultural), which are aligned with personal and cultural goals of providing for future generations (McAdams et al., 1986, 1993).

From a different perspective, Kotre (1984) examined generativity and identified four distinct forms in which it can manifest, eliminating any age or societal role-based limitations. He categorized the forms of generativity as biological (such as nurturing children), parental (including providing for and disciplining one's children), technical (involving transferring skills to those with less proficiency, often done by teachers), and cultural (wherein teachers transmit not only skills but also their meanings) (Kotre, 1984).

Another group of scholars, including Bradley (1997), Bradley and Marcia (1998), Morselli (2013), and Morselli and Passini (2015), examined the relationship between future time perspective (Zimbardo & Boyd, 1999) and generativity, highlighting the role of generativity in enabling individuals to project themselves into the future and consider the long-term consequences of their actions (Bradley & Marcia, 1998). Generativity, in this context, reflects a broad social responsibility,

extending beyond personal and instrumental goals (Marcia, 2010). Subsequently, Morselli and Passini (2015) developed the concept of «social generativity» to capture individuals' responsibility for future generations and their involvement in present actions for the benefit of the community. Finally, a recent systematic review by Doerwald et al. (2021) has suggested that generativity could be a valuable resource also in the workplace, associated with a range of positive work-related outcomes and well-being, highlighting the potential benefits of including it within the domain of positive psychological resources.

Considering the advancements in generativity theory and research, there is also an increasing interest in its application to environmental challenges and ecology issues. McAdams and de St. Aubin (1992) included environmental issues in the domain of generative concerns, which motivate individuals towards generative actions to protect the environment. However, they did not expand on this concept. Schoklitsch and Baumann (2011), to the best of our knowledge, were the first ones to provide an overview of ecological generativity. However, they considered it as the third factor of a broader measurement model together with Kotre's (1984) other four forms of generativity.

Alisat and colleagues (2014) explored the relationships between generativity and individual responses to environmental issues by comparing the narratives of a group of environmental activists with those of non-activists. They observed that generativity was positively associated with environmental identity, environmental narratives, and strong feelings of connection with nature. More recently, adhering to the principle of the psychology of sustainability and sustainable development (Di Fabio, 2017a; Di Fabio and Rosen, 2018, 2020), Di Fabio & Svicher (2023) have enriched the perspective of ecological generativity, introducing the integrated construct of eco-generativity and an instrument to measure it, namely the Eco-Generativity Scale (Di Fabio & Svicher, 2023). The psychology of sustainability and sustainable development is a research area that integrates psychological perspectives in advancing sustainability science (Dincer & Rosen, 2013; Rosen, 2009, 2017), accounting for individuals, various environments and their interrelationships. It supports the principle of sustainable psychological processes by not only adhering to a decreasing supply of resources but also regenerating resources following a positive-oriented approach (Di Fabio, 2017b). This perspective requires a shift toward positive variables that can regenerate psychological resources and move toward sustainability-related processes (Di Fabio, 2017b). According to these principles, the Eco-Generativity Scale was developed to be a constructive proposal for coping with environmental and climate change challenges (Cunsolo & Ellis, 2018; Heeren & Asmundson, 2023; Morrison et al., 2022), also including eco-anxiety (Boluda-Verdú et al., 2022).

Starting from these premises, eco-generativity was proposed as an integrated construct advancing previous contributions. It incorporates four facets: two

forms of generativity, namely, ecological generativity (Schoklitsch & Baumann, 2011) and social generativity (Morselli & Passini, 2015), as well as environmental identity (Clayton et al., 2021) and agency/pathways (Snyder et al., 1991). Ecological generativity is rooted in the ecological generativity factor of the Gen-Current (current generative concerns) Scale (Schoklitsch & Baumann, 2011), which comprises concerns dealing with caring about the use of energy, respecting the environment, and living ecologically including the protection of animals. Social generativity is rooted in the Social Generativity Scale (Morselli & Passini, 2015), which taps into an inclusive approach to society, which comprises responsibility for future generations, participation in current actions that benefit one's living community, and helping others to foster self-improvement. Environmental identity is rooted in the valuable contribution of the Revised Environmental Identity Scale (IED-R) (Clayton et al., 2021), dealing with cognitive, behavioural, and emotional aspects of how individuals perceive their relationship with nature (Clayton et al., 2021). The construct of Agency/Pathways is rooted in the construct of Hope (Snyder et al., 1991). Agency refers to the sense of achievement that comes from attaining goals in the past, present, and future, while Pathways refer to the capacity to develop strategies that are successful in reaching goals. The Eco-Generativity Scale was developed starting from these relevant integrated constructs (Ecological generativity, Social Generativity, Environmental Identity and Agency/Pathways), generating an initial pool of 35 items rated on a 7-point Likert Scale. However, since the construct of eco-generativity has not been empirically evaluated yet, the aim of the present study is to explore the construct validity of the Eco-Generativity Scale through an exploratory factor analysis. We tested a scale theoretically composed of four factors (Ecological Generativity, Social Generativity, Environmental Identity, and Agency/Pathways) (Di Fabio & Svicher, 2023) to explore the factor structure of the scale. Furthermore, reliability of the scale and concurrent validity with satisfaction with life and flourishing were conducted.

Methods

Participants and Procedure

One-hundred and forty-one (n = 141) students attending university in Tuscany, Central Italy (Mage = 20.53, DS = 2.83; male = 41.1%, female = 51.8%; 7.1% prefer not to say) participated in the present study in a voluntary manner. All the participants provided written informed consent in accordance with Italian privacy legislation (Law Decree DL 196/2003) and the EU General Data Protection Regulation (EU 2016/679). The administration order was balanced to counteract presentation order.

Measures

The Eco-Generativity Scale (by Di Fabio & Svicher) is initially composed of 35 items. It comprises four factors, namely, Ecological generativity, Social Generativity, Environmental Identity and Agency/Pathways. All the items were rated on a seven-point Likert scale (from 1 = *Strongly disagree* to 7 = *Strongly agree*).

The *Satisfaction with Life Scale* (SWLS; Diner et al., 1985; Italian version: Di Fabio & Gori, 2016). The SWLS is a unidimensional five-item self-report scale that measures a set of cognitive processes inherent to the overall subjective perception of well-being and focusing on the individual's autonomous judgment capacity (Diner et al., 1985; Di Fabio & Gori, 2016). Respondents answered items on a seven-point Likert scale (1-7, from *Strongly agree* to *Strongly disagree*). Cronbach's alpha was 0.87.

The Flourishing Scale (FS; Diener et al., 2010; Italian version: Di Fabio, 2016). The FS is an 8-item self-report scale that measures sociopsychological prosperity inherent to the perceived success in relevant areas of the individual's life, such as self-esteem, relationships, and optimism (Diener et al., 2010). Respondents express their degree of agreement on a 7-point Likert scale (1-7; from *Completely disagree* to *Strongly agree*). Cronbach's alpha was 0.89.

Data analysis

The Eco-Generativity Scale factor structure was examined by means of exploratory factor analysis with principal axis factoring and Varimax rotation. The *Kaiser-Meyer-Olkin test* (KMO) and *Bartlett's test of sphericity* were performed (Bartlett, 1950; Kaiser & Rice, 1974). Factor structure was judged adequate with a KMO > 0.80 (Kaiser & Rice, 1974) and a statistically significant Bartlett's test of sphericity (Bartlett, 1950). We ran Horn's parallel analysis (Horn, 1965) to identify the number of factors to extract. Factor loadings greater than 0.30 were considered acceptable and greater than 0.50 good (Osborne et al., 2008). Reliability of the Eco-Generativity Scale was examined using Cronbach's alpha coefficient. A Cronbach alpha > 0.70 was judged acceptable (Nunnally & Bernstein, 1994). Pearson correlations were run to examine convergent validity with the SWLS and the FS.

Results

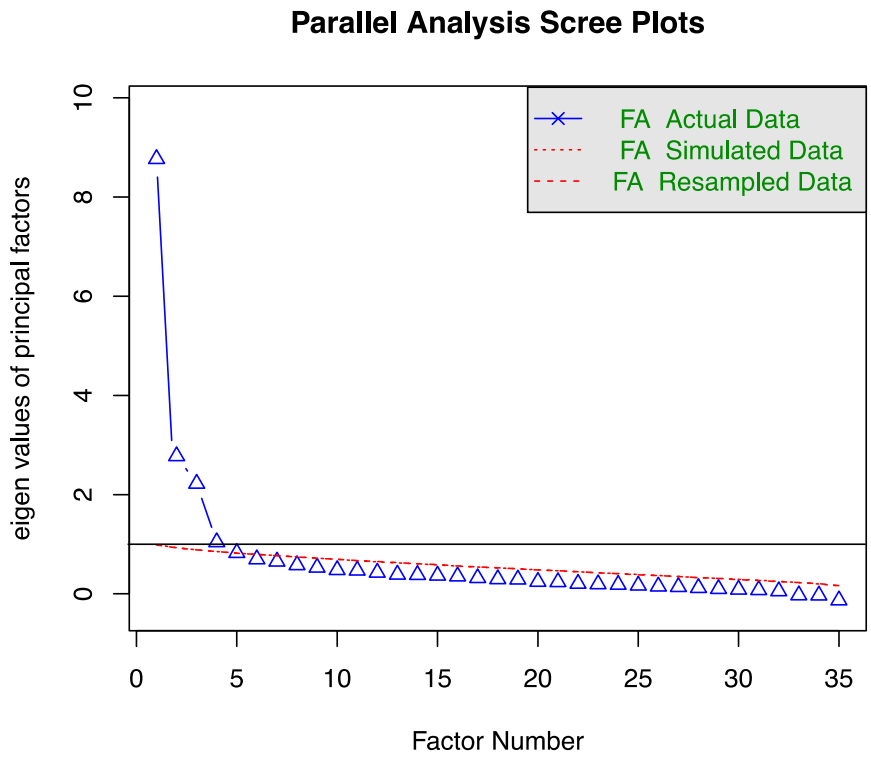
Figure 1 shows the results of Horn's parallel analysis run on the initial pool of 35 items indicating that a four-factor solution fit the data. Table 1 reports the results of the exploratory factor analyses (EFA) (KMO = 0.85; Bartlett's test of

sphericity < 0.001). Since seven items displayed cross-loading across different factors they were removed from the EFA. Table 2 shows the results of the EFA performed on 28 items (KMO = 0.88; Bartlett's test of sphericity < 0.001), revealing that all the items have acceptable loadings on four factors and no overlap with other factors. Factor 1 (11 items) reflected environmental identity, thus was labelled «EGS Environmental Identity». Factor 2 reflected Agency/Pathways, thus was labelled «EGS Agency/Pathways». Factor 3 reflected social generativity, thus was labelled «EGS Social Generativity». Lastly, Factor 4 reflected ecological generativity, thus was labelled «EGS Ecological Generativity».

Table 3 shows that all the factors (EGS Environmental Identity, EGS Agency/Pathways, EGS Social Generativity and EGS Ecological Generativity) displayed good reliability in terms of Cronbach alphas (> 0.70) (Table 3).

Table 4 reports Pearson correlations among the EGS, the SWLS, and FS. Results showed statistically significant and positive correlations between the EGS factor and the SWLS, as well as between the EGS factor and the FS (Table 4).

Figure 1



Eco-Generativity Scale: Horn's Parallel analysis (n = 141)

Table 1

Eco-Generativity Scale: Exploratory factor analysis (principal axis factoring with Varimax rotation) for the 35-item solution (n = 141)

		1	2	3	4
# of Items	Item	λ	λ	λ	λ
1	IA11	0.884			
2	IA9	0.845			
3	IA4	0.814			
4	IA13	0.782			
5	IA8	0.731			
6	IA10	0.707			
7	IA2	0.699			
8	IA1	0.692			
9	IA14	0.685			
10	IA5	0.612			
11	A12	0.591			
12	IA7	0.571†		0.404†	0.379†
13	IA3	0.508†		0.446†	
14	GE6	0.492†		0.434†	
15	HP6		0.79		
16	HP12		0.761		
17	HP2		0.744		
18	HP10		0.699		
19	HP8		0.695		
20	HP1		0.612		
21	HP9		0.562		
22	HP4		0.476		
23	GS1			0.777	
24	GS3			0.774	
25	GS5			0.739	

		1	2	3	4
# of Items	Item	λ	λ	λ	λ
26	GS2			0.724	
27	GS4			0.674	
28	GS6			0.518	
29	GE5	0.364†		0.407†	
30	GE7	0.431†		0.422†	
31	GE3				0.787
32	GE2				0.651
33	IA6	0.442†			0.556†
34	GE1				0.554
35	GE4				0.500

EG = Ecological Generativity items; SG = Social Generativity items; ED = Environmental Identity items; HP = Hope items; λ: Factor loadings. Factor loadings > 0.35 are considered acceptable.

Table 2

Eco-Generativity Scale: Exploratory factor analysis (principal axis factoring) for the 28-item solution (n = 141)

		1	2	3	4
# of Items	Item	λ	λ	λ	λ
1	IA11	0.891			
2	IA9	0.852			
3	IA4	0.818			
4	IA13	0.791			
5	IA8	0.739			
6	IA10	0.707			
7	IA2	0.700			
8	IA1	0.699			
9	IA14	0.690			
10	IA5	0.597			
11	IA12	0.576			

		1	2	3	4
# of Items	Item	λ	λ	λ	λ
12	HP6		0.800		
13	HP2		0.759		
14	HP12		0.748		
15	HP10		0.691		
16	HP8		0.671		
17	HP1		0.612		
18	HP4		0.493		
19	GS3			0.774	
20	GS1			0.770	
21	GS5			0.743	
22	GS2			0.734	
23	GS4			0.695	
24	GS6			0.523	
25	GE3				0.745
26	GE2				0.686
27	GE1				0.544
28	GE4				0.525

EG = Ecological Generativity items; SG = Social Generativity items; ED = Environmental Identity items; HP = Hope items; λ: Factor loadings. Factor loadings > 0.35 are considered acceptable.

Table 3

Cronbach's alphas for the Factors of the Eco-Generativity Scale

Factors	Cronbach's Alpha
1 EGS GE	0.80
2 EGS GS	0.89
3 EGS IA	0.94
4 EGS HP	0.87

EGS = *Ecological-Generativity Scale;* EG = Ecological Generativity factor; SG = Social Generativity factor; ED = Environmental Identity factor; HP = Hope factor.

Table 4

Correlations between the Eco-Generativity Scale Factors, the Satisfaction with Life Scale and the Flourishing Scale (n = 141)

	1	2	3	4	5	6
1 EGS GE	1					
2 EGS GS	0.47**	1				
3 EGS IA	0.56**	0.39**	1			
4 EGS HP	0.31**	0.41**	0.40**	1		
5 SWLS	0.36**	0.28**	0.32**	0.53**	1	
6 FS	0.39**	0.31**	0.37**	0.51**	0.52**	1

EGS = *Ecological-Generativity Scale;* EG = Ecological Generativity factor; SG = Social Generativity factor; ED = Environmental Identity factor; HP = Hope factor; SWLS = Satisfaction with Life Scale; FS = Flourishing Scale. ** $p \leq 0.01$

Discussion

The current study carried out a series of EFA to test the construct validity of the newly advanced Eco-Generativity Scale. The tested solution comprising four factors (Ecological Generativity, Social Generativity, Environmental Identity, and Agency/Pathways) showed a good solution for a scale composed of 28 items. The result is in line with the theoretical framework proposed by Di Fabio and Svicher (2023), which advanced the idea of a construct of eco-generativity dealing with the concepts of Ecological and Social Generativity, Environmental Identity, and Agency/Pathways. Furthermore, the four factors showed adequate internal consistency, supporting the trustworthiness of the advanced factor structure. Lastly the four factors of the scale were positively correlated with satisfaction with life and flourishing, illustrate a good concurrent validity with measures of both hedonic and eudaimonic well-being. The findings seem to be encouraging, opening the possibility for new research and intervention lines on the basis of eco-generativity. In this perspective, eco-generativity could be a promising positive psychological variable for advancing new perspectives in studying adaptive psychological responses to facing environmental challenges, including eco-anxiety.

The current study has limitations and strengths. Our results were carried out on participants who were university students. Thus, an additional investigation might broaden the current study to include adults, adults in the workforce, and older people. Despite this, young adults were identified as the group that shows a greater impairment in response to environmental issues (Boluda-Verdú et al., 2022). Thus, the study of eco-generativity in these participants could be relevant

for identifying positive resources, and also for coping with their negative internal states. Additional studies could also expand the investigation of the construct via confirmatory factor analysis and item response theory models to refine the psychometric properties of the scale or perform item-level statistics (e.g., Sijtsma & van der Ark, 2017; Xiong et al., 2020). Future research perspectives could investigate the association between the construct of eco-generativity and other psychological variables: for hedonic well-being positive and negative affect (Watson, Clark & Tellegen, 1988) in addition to satisfaction with life, and for eudemonic well-being meaning in life (Morgan & Farsides, 2009) in addition to flourishing. Other promising variables to take into account could be resilience (Wilson et al., 2019), emotional intelligence (Petrides & Furnham, 2000), humour (Martin et al., 2003), and perfectionism (Smith et al., 2016).

In brief, the recently advanced construct of eco-generativity has received the first empirically-driven support, providing the first evidence of a four-factor solution. It opens new opportunities for research and intervention to study eco-generativity as an encouraging positive perspective to help individuals to cope with environmental challenges as well as concerns, sustaining the positive psychological processes anchored to the psychology of sustainability and sustainable development for preserving the environment/environments and individuals in the environment/s (Di Fabio, 2017b; Di Fabio & Rosen, 2018, 2020). Furthermore, eco-generativity could be an interesting variable in the study of the virtuous circles of mutual interaction between prosocial behaviour, pro-environmental behaviour and sustainable development in order to promote well-being and also protect against negative internal states such as eco-anxiety.

References

Alisat, S., Norris, J. E., Pratt, M. W., Matsuba, M. K., & McAdams, D. P. (2014). Caring for the earth: Generativity as a mediator for the prediction of environmental narratives from identity among activists and nonactivists. *Identity*, *14*(3), 177-194. https://doi.org/10.1080/15283488.2014.921172,

Bartlett, M. S. (1950). Tests of significance in factor analysis. *British Journal of Psychology, 3,* 77-85.

Boluda-Verdú, I., Senent-Valero, M., Casas-Escolano, M., Matijasevich, A., & Pastor-Valero, M. (2022). Fear for the future: Eco-anxiety and health implications, a systematic review. *Journal of Environmental Psychology*, *84*, 101904. https://doi.org/10.1016/j.jenvp.2022.101904.

Bradley, C. L. (1997). Generativity-stagnation: Development of a status model. *Developmental Review*, *17*(3), 262-290.

Bradley, C. L., & Marcia, J. E. (1998). Generativity-stagnation: A five-category model. *Journal of Personality, 66*(1), 39-64. https://doi.org/10.1111/1467-6494.00002.

Campbell-Sills, L., & Stein, M. B. (2007). Psychometric analysis and refinement of the Connor-davidson Resilience Scale (CD-RISC): Validation of a 10-item measure of resilience. *Journal of traumatic stress*, *20*(6), 1019-1028. https://doi.org/10.1002/jts.20271.

Cianconi, P., Hanife, B., Hirsch, D., & Janiri, L. (2023). Is climate change affecting mental health of urban populations? *Curr. Opin. Psychiatry*. doi: 10.1097/yco.0000000000000859.

Clayton, S., Czellar, S., Nartova-Bochaver, S., Skibins, J. C., Salazar, G., Tseng, Y.-C., Irkhin, B., & Monge-Rodriguez, F. S. (2021). Cross-Cultural Validation of A Revised Environmental Identity Scale. *Sustainability*, *13*(4), 2387. https://www.mdpi.com/2071-1050/13/4/2387.

Clayton, S., & Karazsia, B. T. (2020). Development and validation of a measure of climate change anxiety. *Journal of Environmental Psychology*, *69*, 101434. https://doi.org/10.1016/j.jenvp.2020.101434.

Clayton, S., Manning, C. M., Krygsman, K., & Speiser, M. (2017). *Mental Health and Our Changing Climate: Impacts, Implications, and Guidance*. Washington, D.C.: American Psychological Association, and ecoAmerica.

Cunsolo, A., & Ellis, N. R. (2018). Ecological grief as a mental health response to climate change-related loss. *Nature Climate Change*, *8*(4), 275-281. https://doi.org/10.1038/s41558-018-0092-2.

Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D.-w., Oishi, S., & Biswas-Diener, R. (2010). New Well-being Measures: Short Scales to Assess Flourishing and Positive and Negative Feelings. *Social Indicators Research*, *97*(2), 143-156. https://doi.org/10.1007/s11205-009-9493-y.

Di Fabio, A. (2014) Hope Scale: Psychometric properties of the Italian version. *Counseling. Gornale Italiano di Ricerca e Applicazioni 7(3),* 351-357.

Di Fabio, A. (2016). *Flourishing Scale*: Primo contributo alla validazione della versione italiana [*Flourishing Scale*: First contribution to the validation of the Italian version] *Counseling. Giornale Italiano di Ricerca e Applicazioni, 9*(1). doi: 10.14605/CS911606

Di Fabio, A. (2017a). Positive Healthy Organizations: Promoting well-being, meaningfulness, and sustainability in organizations. *Frontiers in Psychology. Organizational Psychology*, *8*, 1938. https://doi.org/10.3389/fpsyg.2017.01938.

Di Fabio, A. (2017b). The Psychology of Sustainability and Sustainable Development for Well-Being in Organizations. *Frontiers in Psychology*, *8*. https://doi.org/10.3389/fpsyg.2017.01534.

Di Fabio, A., & Gori, A. (2016). Measuring adolescent life satisfaction: Psychometric properties of the Satisfaction with Life Scale in a sample of Italian adolescents and young adults. *Journal of Psychoeducational Assessment*, *34*(5), 501-506. doi:10.1177/0734282915621223.

Di Fabio, A. & Rosen, M. A. (2018). Opening the Black Box of Psychological Processes in the Science of Sustainable Development: A New Frontier. *European Journal of Sustainable Development Research, 2*(4), 47. https://doi.org/10.20897/ejosdr/3933.

Di Fabio, A., & Rosen, M. A. (2020). An Exploratory Study of a New Psychological Instrument for Evaluating Sustainability: The Sustainable Development Goals Psychological Inventory. *Sustainability*, *12*(18), 7617. https://doi.org/10.3390/su12187617.

Di Fabio, A., & Svicher, A. (2023). *Eco-Ansia ed Eco-Generatività: Introduzione ai costrutti e presentazioni dati di ricerca.* [*Eco-Anxiety and Eco-Generativity: Introduction to research constructs and data presentations*]. Unifi Green Week. Seminar at the University of Florence, Florence, Italy 20 April 2023.

Diener, E. D., Emmons, R. A., Larsen, R. J., and Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, *49*(1), 71-75. https://doi.org/10.1207/s15327752jpa4901_13

Dincer, I., & Rosen, M. A. (2013). *Exergy. Energy, Environment and Sustainable Development* (*Second Edition*). Elsevier. https://doi.org/10.1016/B978-0-08-097089-9.05001-4.

Doerwald, F., Zacher, H., Van Yperen, N. W., & Scheibe, S. (2021). Generativity at work: A meta-analysis. *Journal of Vocational Behavior*, *125*, 103521. https://doi.org/10.1016/j.jvb.2020.103521.

Gibson, K.E., Barnett, J., Haslam, N., & Kaplan, I. (2020). The mental health impacts of climate change: Findings from a Pacific Island atoll na-

tion. *Journal of Anxiety Disorders,* 73, 102237. doi: 10.1016/j.janxdis.2020.102237.

Erikson, E. H. (1963). *Childhood and society* (*Revised ed.*). New York: Norton.

Erikson, E. H. (1968). *Identity: Youth and crisis*. New York: Norton.

Erikson, E. H. (1974). *Dimensions of a new identity*. New York, NY: W. W. Norton & Company.

Erikson, E.H. (1980). *Identity and the life cycle*. New York: Norton & Company.

Erikson, E. H. (1982). *The life cycle completed: A review*. New York: Norton & Company.

Hickman, C., Marks, E., Pihkala, P., Clayton, S., Lewandowski, R. E., Mayall, E. E., et al. (2021). Climate anxiety in children and young people and their beliefs about government responses to climate change: a global survey. *Lancet Planet. Health* 5, e863-e873. doi: 10.1016/S2542-5196(21)00278-3.

Hajek, A., & König, H. H. (2022). Climate anxiety in Germany. *Public Health*, *212*, 89-94. doi: 10.1016/j.puhe.2022.09.007.

Heeren, A., & Asmundson, G. J. (2022). Understanding climate anxiety: What decision-makers, health care providers, and the mental health community need to know to promote adaptative coping. *Journal of Anxiety Disorders*, 102654. https://doi.org/10.1016/j.janxdis.2022.102654.

Heeren, A., Mouguiama-Daouda, C., & Contreras, A. (2022). On climate anxiety and the threat it may pose to daily life functioning and adaptation: A study among European and African French-speaking participants. *Clim. Change 173*(1), 15. doi: 10.1007/s10584-022-03402-2.

Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika*, *30*, 179-185.

Kaiser, H. F., & Rice, J. (1974). Little jiffy, mark IV. *Educational and psychological measurement*, *34*(1), 111-117. https://doi.org/10.1177/001316447403400113,

Kotre, J. N. (1984). *Outliving the self: How we live on in future generations*. New York: Norton & Company.

Marcia, J. E. (2010). Life transitions and stress in the context of psychosocial development. In T. W. Miller (Ed.), *Handbook of stressful transitions across the lifespan* (pp. 19-34). New York: Springer.

Massazza, A., Ardino, V., & Fioravanzo, R. E. (2022). Climate change, trauma and mental health in Italy: a scoping review. *European Journal of Psychotraumatology, 13,* 1-16. doi: 10.1080/20008198.2022.2046374.

McAdams, D. P., & de St. Aubin, E. (1992). A Theory of Generativity and Its Assessment Through Self-Report, Behavioral Acts, and Narrative Themes in Autobiography. *Journal of Personality and Social Psychology*, *62*(6), 1003-1015. https://doi.org/10.1037/0022-3514.62.6.1003

Morgan, J., & Farsides, T. (2009). Measuring Meaning in Life. *Journal of Happiness Studies*, *10*(2), 197-214. https://doi.org/10.1007/s10902-007-9075-0.

Morrison, T. H., Adger, W. N., Agrawal, A., Brown, K., Hornsey, M. J., Hughes, T. P., Jain, M., Lemos, M. C., McHugh, L. H., O'Neill, S., & Van Berkel, D. (2022). Radical interventions for climate-impacted systems. *Nature Climate Change*, *12*(12), 1100-1106. https://doi.org/10.1038/s41558-022-01542-y.

Morselli, D., & Passini, S. (2015). Measuring Prosocial Attitudes for Future Generations: The Social Generativity Scale. *Journal of Adult Development*, *22*(3), 173-182. https://doi.org/10.1007/s10804-015-9210-9.

Martin, R. A., Puhlik-Doris, P., Larsen, G., Gray, J., & Weir, K. (2003). Individual differences in uses of humor and their relation to psychological well-being: Development of the Humor Styles Questionnaire. *Journal of Research in Personality*, *37*(1), 48-75. https://doi.org/10.1016/S0092-6566(02)00534-2.

McAdams, D. P., Ruetzel, K., & Foley, J. M. (1986). Complexity and generativity at mid-life: Relations among social motives, ego development, and adults' plans for the future. *Journal of Personality and Social Psychology, 50*(4), 800-807. https://doi.org/10.1037/0022-3514.50.4.800.

McAdams, D. P., de St. Aubin, E., & Logan, R. L. (1993). Generativity among young, midlife, and older adults. *Psychology and Aging, 8*(2), 221-230. https://doi.org/10.1037/0882-7974.8.2.221.

Morselli, D. (2013). The olive tree effect: Future time perspective when the future is uncertain. *Culture & Psychology*, *19*, 305-322. doi: 10.1177/1354067X13489319.

Nunnally, J. C., & Bernstein, I. H. (1994). The Assessment of Reliability. *Psychometric Theory, 3,* 248-292.

Osborne, J. W., Costello, A. B., & Kellow, J. T. (2008). Best Practices in Exploratory Factor Analysis. In J. W. Osborne (Ed.), *Best Practices in Quantitative Methods* (pp. 205-213). London: Sage.

Petrides, K. V., & Furnham, A. (2000). On the dimensional structure of emotional intelligence. *Personality and Individual Differences*, *29*(2), 313-320. https://doi.org/10.1016/S0191-8869(99)00195-6.

Rosen, M. A. (2009). Energy sustainability: A pragmatic approach and illustrations. *Sustainability, 1*(1), 55-80. https://doi.org/10.3390/su1010055.

Rosen, M. A. (2017). Sustainable Development: A Vital Quest. *European Journal of Sustainable Development Research, 1*(1), 2. https://doi.org/10.20897/ejosdr.201702.

Ruch, W., Heintz, S., Platt, T., Wagner, L., & Proyer, R. T. (2018). Broadening humor: Comic styles differentially tap into temperament, character, and ability. *Frontiers in Psychology, 9,* Article 6. https://doi.org/10.3389/fpsyg.2018.00006

Schoklitsch, A., & Baumann, U. (2011). Measuring generativity in older adults: The development of new scales. *GeroPsych: The Journal of Gerontopsychology and Geriatric Psychiatry*, *24*(1), 31-43. https://doi.org/10.1024/1662-9647/a000030

Sijtsma, K., & van der Ark, L. A. (2017). A tutorial on how to do a Mokken scale analysis on your test and questionnaire data. *British Journal of Mathematical and Statistical Psychology*, *70*(1), 137-158. https://doi.org/10.1111/bmsp.12078

Smith, M. M., Saklofske, D. H., Stoeber, J., & Sherry, S. B. (2016). The Big Three Perfectionism Scale: A New Measure of Perfectionism. *Journal of Psychoeducational Assessment*, *34*(7), 670-687. https://doi.org/10.1177/0734282916651539

Snyder, C. R., Harris, C., Anderson, J. R., Holleran, S. A., Irving, L. M., Sigmon, S. T., Yoshinobu, L., Gibb, J., Langelle, C., & Harney, P. (1991). The will and the ways: Development and validation of an individual-differences measure of hope. *Journal of Personality and Social Psychology, 60*(4), 570–585. https://doi.org/10.1037/0022-3514.60.4.570.

Stewart, A. E. (2021). Psychometric Properties of the Climate Change Worry Scale. *International Journal of Environmental Research and Public Health*, *18*(2), 494.

Tam, K. -P., Chan, H. -W., & Clayton, S. (2023). Climate change anxiety in China, India, Japan, and the United States. *Journal of Environmental Psychology, 87*, 101991. doi: 10.1016/j.jenvp.2023.101991.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*(6), 1063-1070. https://doi.org/10.1037/0022-3514.54.6.1063.

Watts, N., Amann, M., Arnell, N., Ayeb-Karlsson, S., Beagley, J., Belesova, K., et al. (2021). The 2020 report of The Lancet Countdown on health and climate change: responding to converging crises. *Lancet Global*, 397, 10269, 129-170. doi: 10.1016/S0140-6736(20)32290-X.

Wilson, C. A., Plouffe, R. A., Saklofske, D. H., Di Fabio, A., Prince-Embury, S., & Babcock, S. E. (2019). Resiliency across cultures: A validation of the Resiliency Scale for Young Adults. *Journal of Psychoeducational Assessment, 37*(1), 14-25. https://doi.org/10.1177/0734282917740017.

Xiong, J., Ding, S., Luo, F., & Luo, Z. (2020). Online Calibration of Polytomous Items Under

the Graded Response Model. *Frontiers in Psychology*, *10*. https://doi.org/10.3389/fpsyg.2019.03085

Zimbardo, P. G., & Boyd, J. N. (1999). Putting time in perspective: A valid, reliable individual-differences metric. *Journal of Personality and Social Psychology*, *77*, 1271-1288. doi 10.1007/978-3-319-07368-2_2.