Research Article

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Measuring engagement with green guidance: Validation of new instruments and a mediation model

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Abstract

This article validates two instruments which measure careers practitioners' engagement with green guidance (GG) and their perception of clients' attitudes towards GG. Building on existing research on the relationship between career guidance and environmental/climate issues, it is a secondary inferential analysis of data collected within a practice-development project focused on GG amongst 666 European practitioners. Findings support these measures' validity, and suggest that practitioners' attitudes towards GG are influenced by their attitudes towards climate change, in which their perception of their clients' attitudes towards GG is a mediator. Implications are discussed, aiming to support practitioners' reflections on their own attitudes and practices.

Keywords: environment; green guidance; career education and guidance; psychometric measure; validation

Introduction

There is a scientific consensus that there is an environmental crisis caused by human activities, and which is already having a major effect on the functioning of human life

(IPCC, 2023). The effects of climate change are expected to increase throughout the next century, with temperatures rising to at least 2.5C above pre-industrial levels, and being felt in all spheres of human life, including increased exposure to extreme weather, worsening global health, food shortages, increased migration and changes to work, education and leisure (Carrington, 2024).

The facts of the environmental crisis are sobering and there is a concern that policymakers, businesses and the general population are failing to engage with these problems in sufficiently robustly with potentially disastrous consequences (Hooley et al., 2024). The only good news is that the causes of, and potential solutions to, climate change are well understood, and a range of policies and technologies have been developed which have the potential to slow, mitigate and ultimately reverse climate change (OECD, 2023). Enacting such approaches requires major policy shifts, accompanied by changes in attitudes and actions from a variety of social actors. At present this is not happening on the scale that is needed (IPCC, 2023).

While the green transition will require changes in almost every aspect of life, there is a strong case to be made that the sphere of the labour market will be critical (Cedefop, 2023). The changes associated with climate change as well as green transition policies are likely to impact the mix of roles in the global economy and the skills and training that are needed (Consoli et al., 2016; ILO, 2016).

The recognition that the labour market and educational and occupational choice making are in a dynamic relationship with a changing climate has implications for career development (Kennedy-Moore, 2021; McMahon & Knight, 2024; Rosenthal et al., 2024). Careers unfold within a changing context which is shaped by environmental shifts and that the way in which people manage their careers has profound implications for the environment. This is an important area for further research, but in this article, we want to focus on the role of career guidance in supporting individuals to engage with these issues.

Hooley et al. (2018, p.20) argue that:

> Career guidance supports individuals and groups to discover more about work, leisure and learning and to consider their place in the world and plan for their futures.

They go on to note that such activities use a wider variety of approaches (counselling, classroom learning, information provision, work-related learning), are referred to using a wide variety of terminologies (career development, guidance counselling, vocational guidance) and that they draw on a variety of theoretical traditions. Given the role that career guidance plays in helping individuals and groups to find their place in the world and consider how they are going to engage with the future, guidance practice cannot ignore a phenomenon such as climate change. Rather, as the climate crisis worsens, it is very likely that guidance will be asked to engage with environmental issues further by clients struggling to make sense of these issues and to live their lives and careers in an environmentally sustainable way. Policymakers and funders of guidance services who are keen to utilise guidance as a technology to bring about a greening of the labour market are also likely to ask careers practitioners to engage with these issues more substantially.

There has been discussion about the role of career guidance in addressing issues associated with climate, sustainability and the environment since the 1990s (Bakke et al.,

2024). Plant (1996; 2021) has proposed the idea of 'green guidance' (GG) as an approach through which career guidance practice can address climate change and other issues of sustainability. Other writers have also engaged with these ideas either building on Plant's work or proposing alternative approaches to environmentally focused forms of career guidance (Di Fabio & Bucci, 2016; Guichard, 2022; Rochat, 2024).

As the theorisation of GG has developed, greater clarity has emerged around issues such as what counselling and pedagogic approaches might best be used to deliver GG (Nuttall, 2024; Personen, 2023; Tacchini et al., 2024), how to address ethical issues in GG (Kavková & Šprlák, 2024), and how to train careers practitioners in the use of GG (Grant, 2024). However, despite the energy that is evident in this field, the evidence suggests that GG still has some way to go in order to fully cross into practice. A recent descriptive survey of European guidance practitioners, on which the current study builds, concluded that only around a third of practitioners are practising any form of GG, with a similar amount still unaware of the concept (Hooley et al., 2024). Moreover, these preliminary findings suggested that the overwhelming majority of practitioners (84%) found the idea of GG appealing, though in the qualitative comments some mentioned ethical concerns around impartiality and client centredness.

If GG is to become a reality, then it is critical for career development practitioners to feel confident in what it is, competent to deliver it and able to align new 'green' practices with existing guidance practices, ethics and frameworks. Recent work by Lucas Casanova et al. (2025) has set out a handbook of GG practices which emphasise the importance of working with individuals and groups to raise awareness of environmental issue and develop a sense of individual and collective agency to deliver change, as well as engaging with more systemic forms of action like brokerage, advocacy, lobbying and system change.

Despite the growing body of research and practice on GG, there is at present no robust way in which career development practitioners' engagement with this area can be measured. Ginevra et al. (2024) have developed a useful instrument which assesses 'Activism toward Social and Environmental Sustainability for Career Construction'. Despite its value, this instrument focuses on measuring how career development professionals act in their role as citizens – e.g., staying informed of the issues, promoting environmental sustainability and justice within their organisations. This leaves a gap for an instrument that is able to measure career development professionals' engagement with GG.

This article presents the process of validation of two new instruments focused on practitioners' attitudes to GG, and their perceptions of clients' attitudes to GG; and the findings of a mediation model to understand what may contribute to practitioners' likelihood of engaging with GG, and the role of the above-mentioned practitioners' ethical concerns. This makes an original contribution to the literature and offers valuable new instruments that can be used in the training and evaluation of GG practice (openly accessible in supplementary materials[1]).

1 Supplementary materials to this article have been published at https://ined.hub.ese.ipp.pt/items/show/68 this includes additional tables setting out further statistical details that underpin this article.

Methods

This study conducts secondary inferential analyses of data collected within a practice development project funded by the European Union – *Exploring Green Guidance*. Within this project European guidance practitioners were surveyed to build a baseline picture of career practitioners' engagement with GG through a descriptive analysis (Hooley et al., 2024). It was decided to explore if the items generated for the survey could provide the basis for two new psychometric instruments. This article presents the process of validation of these two scales (study 1); and an exploratory mediation model (study 2).

Hence, our research objectives were to:

1. validate a psychometric measure focused on practitioners' attitudes to GG;
2. validate a psychometric measure focused on practitioners' perceptions of their clients' attitudes to GG; and
3. explore the relationships between these variables and practitioners' perceptions of climate change (Van Valkengoed & Perlaviciute, 2021) through a mediation model.

We hypothesise that practitioners' attitudes towards GG may be influenced by their attitudes towards climate change. Moreover, a mediation model was tested to explore if practitioners' perceptions of their clients' attitudes towards climate change function as a mediator between practitioners' climate change attitudes and their attitudes to GG. Through this mediation model we aim to explore the role of practitioners' ethical concerns.

Procedures

The items included in the survey were developed based on a literature review on GG (Bakke et al., 2024). They were originally developed in English and were discussed with a panel of experts in the area. Subsequently, these items were translated to Czech, Slovak, Norwegian, Polish, Portuguese, and French, and interviews were conducted with practitioners to assess the clarity and accessibility of the translated items, reviewing them when necessary to assess facial and content validity through the interpretation and formulation of items.

The survey was assessed and ethical approval was obtained from the Norwegian National Research Ethics. The sample was collected through an online platform that was disseminated among institutions that employ career practitioners, professional organisations, and through snowballing in the Czech Republic, Norway, Poland, Portugal, Slovakia, UK, France and the wider European careers community. Participants could select which language they wanted to answer the survey in.

Participants

The sample is composed of 666 career practitioners. Table 1 presents the sample characterisation for professional and sociodemographic variables. Regional origin was coded based on countries of origin to allow for a more balanced analysis of data. It is worth mentioning that most Portuguese practitioners identified as psychologists since this is the academic qualification necessary for career counsellors in the country (and so it is perceived as their main professional identity), while most participants from other countries identified as careers practitioners.

Considering that the sample was randomly divided to conduct Exploratory Factor Analyses (EFA) and Confirmatory Factor Analyses (CFA), a chi-square test was performed to assess the existence of significant differences between these samples. No significant differences between these samples were found for Professional Role, Country of Origin and

Geographical Region of origin. Significant differences were found for the sectors in which practitioners work, with a small effect size of 0.14.

Table 1. Sample characterisation for the complete sample, EFA sample and CFA sample.

Variable	Categories	Complete Sample		EFA Sample		CFA Sample		Sample Comparison
								X2 (df); p value
		n	%	n	%	n	%	
Professional Role	Careers practitioner	265	39.8	132	39.6	133	40	12.74 (10); p=.239
	Psychologist	90	13.5	43	12.9	47	14	
	Counsellor in school sector	46	6.9	30	9.0	16	4.8	
	Teacher / educator	83	12.5	42	12.6	41	12	
	Youth worker / social worker	6	0.9	2	0.6	4	1.2	
	Public employment service officer	53	8.0	27	8.1	26	7.8	
	Manager / Leader	40	6.0	16	4.8	24	7.2	
	Academic / Researcher	25	3.8	13	3.9	12	3.6	
	Expert	20	3.0	9	2.7	11	3.3	
	Policymaker	5	0.8	0	0.0	5	1.5	
	Other	33	5.0	19	5.7	14	4.2	
Sector	Schools	205	30.8	106	31.9	99	30	13.26 (5); p=.02
	Vocational education and training (VET)	95	14.3	35	10.6	60	18	
	Higher education (HE)	101	15.2	55	16.5	46	14	
	Public employment services (PES)	111	16.7	53	16	58	17	
	Private practice	48	7.2	29	8.7	19	5.7	
	Other	105	15.8	54	16.2	51	15	
Country of origin	Czech Republic	52	7.8	29	8.7	23	6.9	16.62 (10); p=.08
	Norway	48	7.2	25	7.5	23	6.9	
	Poland	90	13.5	42	12.7	48	14	
	Portugal	106	15.9	58	17.5	48	14	
	Slovakia	95	14.3	49	14.8	46	14	
	UK	53	8.0	26	7.8	27	8.1	
	France	81	12.2	27	8.1	54	16	
	Denmark	43	6.5	19	5.7	24	7.2	
	Italy	48	7.2	25	7.5	23	6.9	
	Switzerland	22	3.3	15	4.5	7	2.1	
	Other	27	4.1	17	5.1	10	3	
Region	Nordic Europe	100	15.0	51	15.3	49	15	2.63 (3); p=.453
	Eastern European	244	36.6	125	37.5	119	36	
	Central European	214	32.1	98	29.4	116	35	
	Southern Europe	108	16.2	59	17.7	49	15	

Note. Complete Sample N=666; EFA Sample N=333; 1 missing values. for Country; 1 missing value. for sector; CFA Sample N=333; n= frequency; % = Percentage.

Measures

Sociodemographic survey

As an exploratory project that aimed to reach a wide group of European practitioners, sociodemographic questions were kept to a minimum to reduce the length of the survey. So, questions focused on variables that could characterise participants professionally, such as their professional role, the sector in which they worked, and their countries.

Climate Change Perceptions Short Scale (Van Valkengoed & Perlaviciute, 2021)

The Climate Change Perceptions Short Scale is a unidimensional scale that addresses five components of Climate change perceptions (reality and causes of climate change, its perceived valence, and the spatial and temporal distance of its consequences) through five items, answered through a 7 points Likert scale between 1 (Strongly Disagree) and 7 (Strongly Agree). It was developed through a thorough process of validation that confirmed its internal consistency, convergent, predictive and discriminant validity, along with measurement invariance for gender and political orientation. Validation procedures were conducted for the present sample and are presented in the results section.

Practitioners' Attitudes to GG Scale

A pool of items was created to explore practitioners' attitudes to GG, leading to the following items: I find the idea of guidance actively addressing issues of climate change and environmental sustainability (GG) appealing; I believe that career development should help people to meet their current needs without compromising the ability of future generations to meet their needs; I believe that helping clients to achieve more environmentally sustainable work and lifestyles should be one of the objectives of career guidance; I am already practicing GG.

The development of items followed common standards for scale development, creating univocal, specific and clear sentences (Clark & Watson, 1995), as previously presented in procedures. Data was collected through a 5 points Likert scale between 1 (Strongly Disagree) and 5 (Strongly Agree). Therefore, higher scores reflect a higher level of engagement with GG, which can vary from attitudinal support to putting it into practice. However, it does not allow us to assess if practitioners have received adequate training to put it into practice, solely their attitudes to its place in career guidance and counselling. Validation procedures and results will be presented in the following section.

Perceptions of Clients' Attitudes to GG Scale

The development of this scale followed the same procedures and steps. It is composed of three items (My clients raise issues to do with the climate or the environment when making career choices; My clients are keen to find environmentally sustainable work; My clients are keen to live environmentally sustainable lifestyles) answered through a 5 point Likert scale between 1 (Strongly Disagree) and 5 (Strongly Agree).

Data analyses

To validate these scales, it was decided to randomly divide the sample into two datasets and use one sample for EFA and the other sample for CFA. These were conducted as a two-step necessary process for the validation of new psychometric scales with independent

samples, in which EFA allows the initial exploration of a latent structure and items' loading, and CFA tests this hypothesised structure and confirms it through a stricter validity assessment. Subsequent analyses used the complete sample.

IBM SPSS Statistics 29 was used to perform descriptive and correlational analyses, as well as EFA. JAMOVI 2.5.3 was used to perform confirmatory factor analyses, multi-group invariance analyses and mediational analyses. Analyses using SPSS excluded missing values cases' pairwise, while for CFA and Invariance Analyses, missing values were imputed using regression analysis using the expectation-maximisation technique.

The sensitivity of all items of the scales was assessed through descriptive statistics to assert the fulfilment of basic assumptions for EFA and structural equation modelling (SEM). Table A in supplementary materials presents these results for means, SD, range, skewness and kurtosis. Moreover, correlations between all items were explored, which can also be analysed in Supplementary materials (Table B).

This was an exploratory study and some items showed problematic scores of skewness and kurtosis (Kline, 2005), mostly the first item of the Climate Change Perceptions short scale (van Valkengoed & Perlaviciute, 2021). These were taken into account for the exploratory analyses of these scales. Results for this scale seem to be skewed towards agreeing with the 'reality' of climate change, which represents social and scientific discourses on this and so, these were considered to be acceptable. Besides this issue, no serious violations in terms of normality, linearity, homogeneity of variance-covariance matrices and multicollinearity were found both in this scale and others. Considering the patterns of outliers, all were kept in the analyses. Further preliminary results of the process of EFA and CFA can be consulted in supplementary materials, as well as the final scales' means, standard deviations and correlations.

Results

Study 1: Validation of the scales

Practitioners' Attitudes to GG Scale

Principal Axis Factoring (PAF) was performed to test a reflective model of this scale, assuming the existence of correlations between items and underlying latent causes (Boorsboom, 2006), and that it is composed by a single factor. Results from PAF showed low to moderate correlations between items, confirming the unidimensionality of the scale (Clark & Watson, 1995), and the Kaiser-Meyer-Olkin (KMO) result was acceptable (.700), though the Bartlett's sphericity test was significant (Tabachnick & Fidell, 1996/2007). Eigenvalues above 1 and the scree plot suggested one or potentially two factors, in which all items are retained with a conservative exclusion criterion of .30.

Therefore, a CFA with Diagonally Weighted Least Squares (DWLS) , as suggested by the literature for ordinal variables (Finney et al., 1998), was performed for one factor with all the items to refine the scale. The model achieved a suffering quality of adjustment considering the following indices (Model A): $\chi 2/df = 8.12$, CFI = .89, TLI = .78; RMSEA = .146; P[rmsea<= 0.05]< .001]; SRMR= .092. Analysing factor loadings, and their R-Square and so, how each item contributes to the latent variable, it was decided to eliminate item 1. The model was then tested, achieving good quality of adjustment (Model B): $\chi 2/df = 1.69$, CFI =

.99, TLI = .98; RMSEA = .046; P[rmsea<= 0.05]= .422; SRMR= .031. Item's standardized regression weights are acceptable, supporting the quality of local adjustment with values between .38 and .79. Table 2 presents results from Model A and Model B.

After confirming the scale's internal structure validity, considering that data were collected in different languages and regions, a multi-group invariance analysis was conducted to corroborate the factor structure for participants from different regions in sequential steps, as suggested in the literature – configural, metric, scalar, strict and structural invariance (Maroco, 2014). Since the Δ χ2 test (and respective p value) is dependent on sample size and has been questioned as a worthy measure to test invariance in large samples and models with different levels of quality or adjustment (Cheung & Rensvold, 2002), other indices were also explored to assess the invariance of the scale, focusing on Δ CFI (< or equal to -.01), Δ RMSEA (< .015), and Δ Standardised Root Mean Square Residual (SRMR) < .025 (Chen, 2007; Cheung & Rensvold, 2002). These procedures were used for all scales under analysis. Multigroup (MG) invariance tests for this scale are presented in Table 3, and seem to suggest configural and metric invariance, considering the Δ χ2 test p value, Δ CFI, Δ RMSEA, showing the potential of the scale by confirming the scale's factor structure and factor loadings' invariance.

Table 2. Goodness of Fit Indices for CFA for all the scales used

	CFA (N=333)								
	χ 2(df)	p	χ2/ df	CFI	TLI	RMSEA	LO 90	HI 90	PCLOSE
Practitioners' attitudes to GG Scale (Model A)	40.6 (5)	< .001	8.12	0.89	0.78	.146	0.107	0.190	< .001
Practitioners' attitudes to GG Scale (Model B)	3.38 (2)	.185	1.69	0.99	0.98	.046	.000	.127	.422
Clients' Attitudes to Sustainability Issues in Relation to Work Scale	8.89 (2)	.012	4.45	.97	.96	.102	.041	.174	.076

Note. χ2 = Chi-Square; df = degrees of freedom; p = P-value; CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA = root mean square error of approximation; LO 90 = lower limit of a 90% confidence interval for the population value of RMSEA; HI 90 = upper limit of a 90% confidence interval for the population value of RMSEA.; PCLOSE = RMSEA P-value.

Perceptions of Clients' Attitudes to GG Scale

An EFA was performed through PAF, reaching moderate correlations between items and an acceptable KMO (.704), with eigenvalues above 1 and the scree plot suggesting one factor in which the three items were retained with a conservative exclusion criterion of .30 and acceptable levels of communalities (.54 to .76) and item loadings (.74 to .87).

Subsequently, a CFA was performed using DWLS estimation. Given that this model is composed of three items, initial results showed a saturated model due to having only three free parameters. Therefore, it was necessary to add another constraint to the model. Despite satisfactory results in terms of CFI and TLI, χ2 and RMSEA advise caution and so this scale should be improved: χ2/df = 4.45, CFI = .97, TLI = 0.96; RMSEA = .102; P[rmsea<= 0.05]= .076; SRMR=.059. Item's standardised regression weights support the quality of local adjustment through adequate results between .62 and .89. Table 2 presents goodness of fit results for this scale.

Table 3. Models' Comparison for Invariance tests for the Practitioners' Attitudes to GG Scale

Invariance level	Definition	Model	χ2	df	Δ χ2	Δ df	p	CFI	RMSEA	Δ CFI	Δ RMSEA	Δ SRMR
Configural invariance	Same factor structure	M1	6.55	8			.586	1.00	.000			
Metric invariance	Same factor structure and factor loadings	M2-M1	15.8	17	9.25	9	.537	1.00	.000	0	0	.027
Scalar invariance	Same factor structure, factor loadings and intercepts	M3-M2	49	26	33.2	9	.004	0.945	.073	-.055	.073	.025
Error variance invariance	Same factor structure, factor loadings and error variances	M4-M3	65.3	38	16.3	12	.004	0.934	.066	-.011	-.007	.021
Structural invariance	Same factor structure, factor loadings, error variances and factors' covariance	M5-M4	124	41	58.7	3	< .001	0.80	0.11	-.134	.045	.043

Note. χ2 = Chi-Square; df = degrees of freedom; Δ χ2 = difference between model's χ2; Δ df = difference between models' df; p = P-value; CFI = comparative fit index; RMSEA = root mean square error of approximation; Δ CFI = difference between model's CFI's; Δ RMSEA = difference between model's RMSEA; Δ SRMR = difference between model's standardized root mean square residuals; M1 to M5 = Models tested.

Subsequently, MG invariance analyses were performed according to the region of origin of participants, presented in Table 4. Though the Δ χ2 test p value is significant in all steps, taking into account Δ CFI, Δ RMSEA and Δ SRMR, results support scalar invariance, while the Δ CFI may suggest strict invariance. Thus, results support the scale's factor structure and factor loadings' invariance. However, as Maroco (2014) states strict invariance is not generally necessary for comparing groups and it is often not found, along with structural invariance.

Table 4. Models' Comparison for Invariance tests for the Perceptions of Clients' Attitudes to GG Scale

	Definition		**χ2**	**df**	**Δ χ2**	**Δ df**	**p**	**CFI**		**Δ CFI**	**Δ RMSEA**	**Δ SRMR**
Configural invariance	Same factor structure	M1		8			.025	.98	.085			
Metric invariance	Same factor structure and factor loadings	M2-M1		14	10.6	6	.014	0.97	.078	.009	-.007	.012
Scalar invariance	Same factor structure, factor loadings and intercepts	M3-M2		14	0	0	.014	0.97	.078	0	0	0
Error variance invariance	Same factor structure, factor loadings and error variances	M4-M3		23	8.3	9	.038	.98	.059	.002	-.019	.017
Structural invariance	Same factor structure, factor loadings, error variances and factors' covariance	M5-M4		26	20.2	3		0.94	.084	-.032	.025	.022

Note. χ2 = Chi-Square; df = degrees of freedom; Δ χ2 = difference between model's χ2; Δ df = difference between models' df; p = P-value; CFI = comparative fit index; RMSEA = root mean square error of approximation; Δ CFI = difference between model's CFI's; Δ RMSEA = difference between model's RMSEA; Δ SRMR = difference between model's standardized root mean square residuals; M1 to M5 = Models tested.

Table 5. Models' Comparison for Invariance tests for the Climate Change Perceptions short scale (van Valkengoed & Perlaviciute, 2021)

Invariance level	Definition	Model	χ2	df	Δ χ2	Δ df	p	CFI	RMSEA	Δ CFI	Δ RMSEA	Δ SRMR
Configural invariance	Same factor structure	M1	0.397	8			1	1.00	.000			
Metric invariance	Same factor structure and factor loadings	M2-M1	8.74	17	8.34	9	.948	1.00	.000	0	0	.056
Scalar invariance	Same factor structure, factor loadings and intercepts	M3-M2	19	26	10.26	9	.834	1.00	.000	0	0	.013
Error variance invariance	Same factor structure, factor loadings and error variances	M4-M3	36.9	38	17.9	12	.52	1.00	.000	0	0	.06
Structural invariance	Same factor structure, factor loadings, error variances and factors' covariance	M5-M4	269	41	232.1	3	< .001	.16	.183	.84	.183	.226

Note. χ2 = Chi-Square; df = degrees of freedom; Δ χ2 = difference between model's χ2; Δ df = difference between models' df; p = P-value; CFI = comparative fit index; RMSEA = root mean square error of approximation; Δ CFI = difference between model's CFI's; Δ RMSEA = difference between model's RMSEA; Δ SRMR = difference between model's standardized root mean square residuals; M1 to M5 = Models tested.

Climate Change Perceptions short scale (van Valkengoed & Perlaviciute, 2021)

Considering that the Climate Change Perceptions short scale (van Valkengoed & Perlaviciute, 2021) is a validated scale, an EFA and CFA were conducted, following best-practice, to ensure the scale's validity and reliability with a specific target group (career practitioners) and other languages. These results can be found in supplementary materials.

Regarding MG invariance tests, according to the abovementioned indices, results for this scale seem to support configural, metric, and scalar invariance, considering Δ χ2 test p value, Δ CFI, and Δ RMSEA, with confidence (Table 5), confirming the scale's factor structure, factor loadings, and intercepts among participants from different European areas.

Reliability of the scales under analysis

The scales' internal consistency was assessed through Cronbach alpha and McDonald's Omega coefficients, as well as through composite reliability (CR) and average variance extracted (AVE). Cronbach, McDonald's Omega, CR and AVE results for the Climate change perceptions short scale (van Valkengoed & Perlaviciute. 2021) and for the Perceptions of Clients' Attitudes to GG Scale achieved satisfactory values, while the Practitioners' Attitudes to GG Scale achieved acceptable results for exploratory research (Hair et al., 1998), providing support for construct validity of these new scales. Table 6 presents these results for all scales under analysis.

Nonetheless, the Practitioners' Attitudes to GG Scale should be developed to improve its psychometric qualities, though these results seem acceptable for exploratory research, with a CR over 0.6 and an AVE of almost 0.4 (Borsboom et al., 2004; Fornell & Larcker, 1981). Besides this scales' Cronbach and McDonald's Omega reaching acceptable coefficients, inter-item correlation for this scale, after eliminating item 1, fits recommended results according to Briggs and Cheek (1986). These results, along with standardised regression weights provide support for the scales' convergent validity. Additionally, each scale's discriminant validity was assessed by comparing their AVE to the square of correlations between the scales. All these results were lower to the AVE of the scales, supporting the scales' discriminant validity.

Table 6. Construct Reliability and Validity for the scales under analysis

Scales	α (n=674)	McDonald's Omega	N. Items	CR	AVE
Climate change perceptions short scale (van Valkengoed & Perlaviciute. 2021)	.86	.86	4	.86	.61
Practitioners' Attitudes to GG Scale	.70	.71	4	.73	.39
Perceptions of Clients' Attitudes to GG Scale	.80	. 81	3	.81	.58

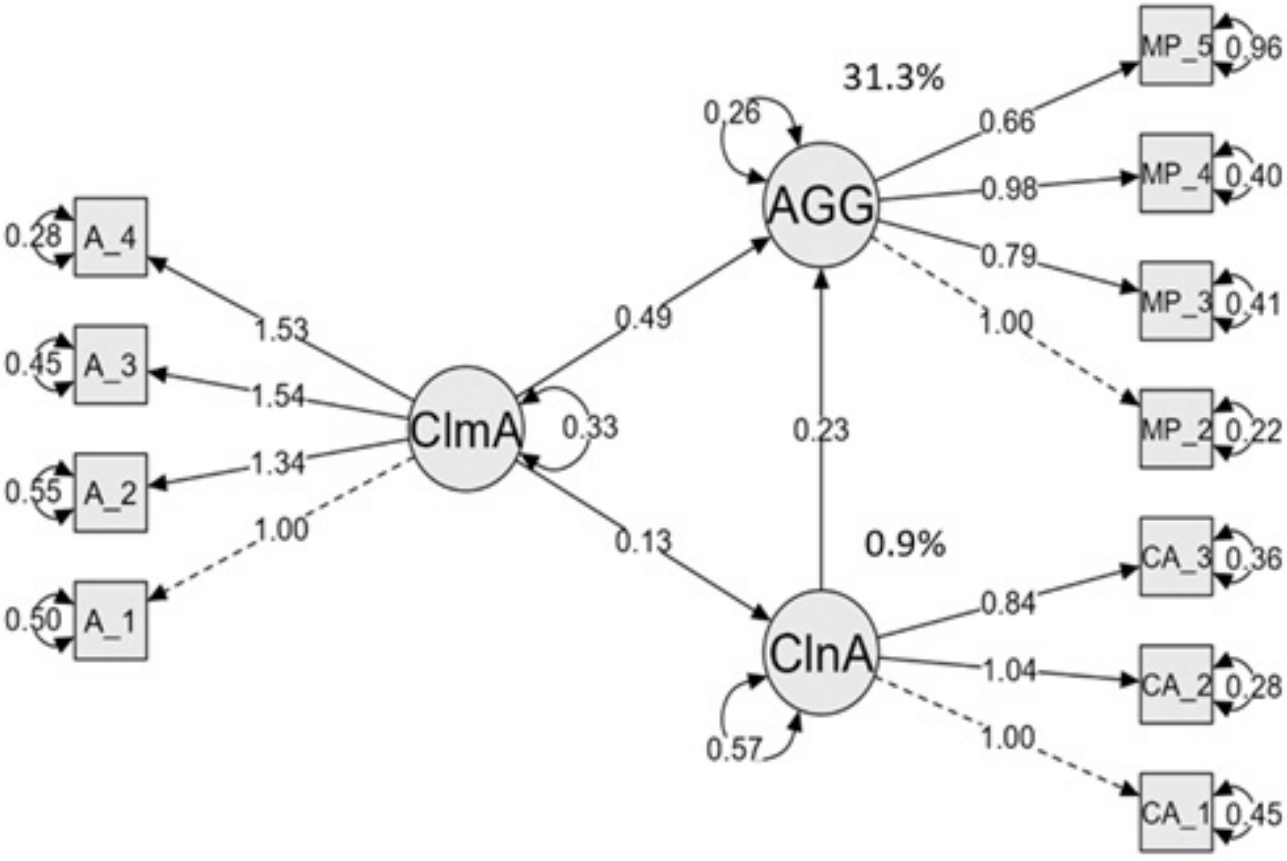
Note. α: Coefficient Cronbach Alpha; RC: reliability composite; AVE=average variance extracted.

Study 2: Mediation model measuring practitioners' engagement with GG

This study explored if practitioners' attitudes towards GG are associated with their attitudes towards climate change, and if practitioners' perceptions of their clients' attitudes towards climate change statistically mediate this association testing a theoretical model through SEM. Moreover, the following findings provide evidence for the Practitioners' Attitudes to GG scale and the Perceptions of Clients' Attitudes to GG scale convergent and divergent validity, furthering evidence for these scales' validity.

A mediation model was tested through DWLS considering that the scales are composed of ordinal variables. As a cross-sectional study, the directional paths here presented are interpreted as theoretically informed correlations, not causal effects. The model achieved good quality of adjustment considering the following indices: $\chi 2/df = 2.31$, CFI =.97, TLI = .96; RMSEA = .044; P[rmsea ≤ 0.05] = .78. Figure 1 presents these results, showing that Practitioners' Climate Change perceptions are significantly positively associated (β=.49; p< .001) with their Attitudes to GG and are positively linked (β=.13; p< .001) with Perceptions of Clients' attitudes to GG. On the other hand, Perceptions of Clients' Attitudes to GG have a significant direct positive association (β=.23; p< .001) with Practitioners' Attitudes to GG.

Figure 1. Model of associations between practitioners' climate change perceptions, perceptions of clients' attitudes, and attitudes to GG (direct effects represent standardised path coefficients). *ClmA – Climate change perceptions short scale; ClnA – Perceptions of Clients' Attitudes to GG Scale; AGG – Practitioners' Attitudes to GG Scale*



The model explains 31.3% of the variance of positive attitudes towards GG, and it explains 0.9% of the variance of perceptions of clients' attitudes towards climate change. Moreover, Practitioners' perceptions of their clients' attitudes to GG functions as a mediator between practitioners' climate change attitudes and their attitudes to GG through a significant indirect positive effect (β=.03; p< .001). There is a significant positive total effect (β=.52; p< .001).

These results suggest that practitioners' attitudes to climate change (as a negative reality, with human causes, with proximal consequences in terms of time and space) are positively associated to their openness to GG through a large effect size (β =.49), commonly described above .5 according to Cohen (1988), which means that for a one-point increase in the mean score regarding climate change perceptions, is associated an estimated increase of 0.5 SD in practitioners' attitudes to GG (standardised for these scales' metrics).

Practitioners' Climate Change Attitudes also associate with their perceptions of clients' attitudes to GG through a small effect size (β =.13), suggesting they may be more attentive to these concerns in their clients (Cohen, 1988). Subsequently, practitioners' Perceptions of Clients' Attitudes to GG as concerned with climate change regarding their career decisions, have a positive association with their openness to GG through an almost medium effect size (β =.23).

The fact that Climate Change Perceptions has a very small indirect positive effect on practitioners' attitudes to GG (0.9% of explained variance), mediated by their perceptions of clients' attitudes to GG suggests that practitioners' perceptions of clients' attitudes play a minimal mediating role in the relationship between climate change perceptions and attitudes towards GG.

Discussion

These studies provide support for the psychometric quality and validity of two new measures of career development practitioners' attitudes to GG. CFA results support the internal structure validity, construct and convergent validity of both new scales, and multi-group measurement invariance analysis according to participants' geographical regions of origin support Practitioners' Attitudes to GG metric invariance, and perceptions of clients' attitudes scalar invariance. Moreover, the correlations between these scales and the Climate Change Perceptions short scale (van Valkengoed & Perlaviciute, 2021) – in supplementary materials – corroborate the scales' divergent validity (which was also assessed through acceptable and good AVE results for the Practitioners' Attitudes to GG Scale and the Perceptions of Clients' Attitudes to GG Scale, respectively). The scales also presented acceptable reliability results based on Cronbach alpha, McDonald's Omega, and Composite Reliability, thus demonstrating their potential for combined use.

Given the emergent literature on GG discussed in the introduction to the article, these scales can become critical tools in understanding practitioners' engagement with GG and targeting training and other GG interventions (Bakke et al., 2024). Theorists and policy makers are united in the idea that career guidance should play a stronger role in the green transition of the labour market. However, at present engagement with these issues amongst practitioners remains limited. The opportunity to ascertain practitioner attitudes will be useful for those looking to identify where training and resources are needed and ascertain the effectiveness

of their implementation. There has already been a range of work that has sought to measure engagement with environment issues in analogous fields such as teaching (Peedikayil et al., 2023), social work (Allen, 2020) and health professionals (Wei et al., 2014). Given this, it is important to measure engagement with environmental issues amongst career development practitioners and the measures validated in this study provide a mechanism for doing this.

However, the current measures remain emergent. Both scales would benefit from further validation studies with a variety of populations. There would also be value in strengthening the scales further through the addition of new and conceptually related items to ensure a stronger measure (Clark & Watson, 1995) and contribute to their reliability. Equally important is the need to develop or identify additional measures which can assess the strength of practice and wider propensity to environmentally positive citizenship (e.g., through the use of Ginevra et al., 2024). It will also be important to examine the impact of a wide range of demographics to understand further what supports engagement with GG, which constitutes one of the limitations of the present study.

The findings reported in study 2 are also of critical importance. However, SEM cannot offer causality without a longitudinal design. So, the hypothesised directionality between variables was guided through theory that suggests that individual environmental beliefs shape attitudes (e.g., Di Fabio & Bucci, 2016), providing the opportunity for testing the theoretical model through psychometric cross-sectional research (Maroco, 2014). Therefore, these findings must be further tested.

Firstly, and unsurprisingly results show that careers practitioners' likelihood of engaging with GG is underpinned by their general level of belief that climate change is a clear and present danger. This raises important issues about how GG can be developed as a practice when professional interventions are unlikely to shape someone's underlying beliefs about climate change (Hornsey et al., 2016). It also raises the question as to whether a positive attitude towards GG is sufficient to propel people to engage with, and develop, GG practices and what may mediate that relationship – e.g., access to training and resources; wider pro- (or anti-) environmental attitudes amongst peers, managers or funders.

The other main finding in study 2 is the role that practitioners' perceptions of their clients' engagement in environmental issues has. This mediational study (assessing the indirect effects of Climate Change Perceptions on Attitudes to GG, mediated through their Perceptions of Clients Attitudes to GG) allows a reflection on one of the concerns expressed by practitioners in preliminary results (Hooley et al., 2024): ethical concerns about introducing environmental issues into career counselling fearing it would tap into political issues that could bias intervention, undermine practitioners' neutrality by enforcing their views on their clients regarding climate change.

Findings show that the reality of climate change associates positively with being open to GG, and with perceiving clients as more open to GG. However, the weak effect size (β =.13) of Climate Change Perceptions on Perceptions of Clients Attitudes, only explaining 0.9% of variance in the latter's variation, may indicate that personal beliefs are not strongly projected onto perceptions of clients. This minimal mediation may suggest that practitioners' perceptions of clients' attitudes do not play a substantial role in shaping their openness to GG. Thus, perceptions of clients' attitudes may have a limited role in explaining practitioners' openness to GG.

This finding is particularly critical because of the centrality of the idea of person/client-centredness (Rogers, 1951) and a range of associated ideas such as non-directivity and impartiality to the practice of career guidance (Hooley, 2023; Kavková & Šprlák, 2024). Such approaches are what Watts (1996) describes as 'liberal' approaches which seek to minimise the substantive influence of the career development practitioner on the decision making of the individual, advancing the ideal of outcome neutrality for the practitioner. This raises ethical and paradigmatic concerns about whether supporting a normative value, such as environmental sustainability, is a legitimate thing to do in career guidance. Such ideas around person-centredness and practitioner neutrality have been critiqued for a variety of reasons, not least the philosophical question as to whether a position of neutrality really exists, particularly within unequal and hierarchical societies (Bassot, 2021; Hooley et al, 2018), but they clearly offer major challenges for 'GG' which is necessarily committed to a normative outcome.

Such challenges are philosophical in nature, and as both Watts (1996) and Sultana (2014) have argued there are a range of ideological positions from which guidance practice can proceed. GG is more typically associated with radical and emancipatory rationalities which view the purpose of guidance as being to promote critical consciousness and awareness of the various dimensions that influence career decision-making. Such approaches de-centre the individual and reconceptualise guidance more contextually by recognising the inter-dependence of individuals, communities and ecosystems. However, this does not mean that GG should be conceived as a normative top-down approach in which career guidance practitioners railroad their clients into choosing 'green' careers. Rather it might be more helpfully considered as a dialectical engagement in which outcomes are constructed by the client through the working relationship with the practitioner. The model discussed in study 2 provides insights that this may be what is happening in practice and that guidance practitioners' engagement with GG is driven, at least in part, by the needs of their clients who are also wrestling with these issues of climate crisis.

There have already been extensive philosophical debates about the nature of GG and how it fits into career guidance theories and practices. But, the voice of the practitioner has been noticeably absent. The development of measures such as those validated in this study offer one way for theorists to listen more carefully to where practitioners are and to explore the ways in which they come to those positions.

Conclusions

The measures developed in this article represent an important step forward in the discussions about GG. They offer a mechanism for deepening understanding of practitioners' positions and exploring the interaction between attitudes, practice and client needs. There would be value on building on this by strengthening these measures, exploring findings with different populations and examining their interaction with other measures such as Ginevra et al. (2024).

The instruments set out in this article might also be useful in supporting practitioners to reflect on their attitudes to, and competence in, GG. They may also prove to be useful tools in measuring the efficacy of initiatives which seek to develop careers practitioners' capacity to address GG.

It is clear that discussion about the climate and the environment more widely are not going to go away. Over the next decade careers practitioners should expect that the environmental context will become increasingly important to their clients, as they navigate a changing education and employment landscape. They should also anticipate that the funders of career guidance provision will increasingly emphasise the importance of green jobs and sustainability competencies. It is hoped that the measures and evidence presented in this article help to ensure that these new forms of practice remain evidence-based and ethical.

Statements and Declarations

Availability of Data and Material

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

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