Original Article

Aware of the Future?

Adaptation and Refinement of the Futures Consciousness Scale

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Abstract. *Introduction:* Futures consciousness (FC) refers to the capacity that a person has for understanding, anticipating, and preparing for the future. A psychometric instrument, the FC scale, was recently developed to measure FC as an interindividual difference. However, this initial scale suffered from some shortcomings due to a few underperforming items. *Objectives:* In this paper, we present and validate the revised FC scale, which aims to address these shortcomings. *Methods and Results:* Data from a representative sample of N = 1,684 British participants demonstrated good psychometric properties of the revised scale (and better than the original) as well as good predictive validity. Specifically, individuals' scores were positively related to self-reported future-oriented behavior, such as engagement in civic collective action and general engagement in politics. The five-dimensional structure of the scale was also replicated. *Conclusion:* The revised FC scale proves a reliable tool that can be used by both researchers and practitioners.

Keywords: anticipation, futures consciousness, future orientation, scale validation, time perspective

Futures consciousness (FC) refers to "the capacity that a person has for understanding, anticipating, and preparing for the future" (Lalot et al., 2020, p. 874). Given the increasingly interconnected and complex world we live in, it is crucial to understand how people think about and project themselves in the future, and their resulting attitudes and behavioral tendencies. Indeed, a growing literature suggests that people who are more oriented toward the future are more likely to adopt various future-oriented behavior, be it centered on the self (e.g., better delay discounting and less procrastinating; Matta et al., 2012; Rebetez et al., 2016) or on others and society in general (e.g., greater engagement in proenvironmental and civic behavior; Lalot et al., 2020; Milfont & Demarque, 2015).

Recently, a FC scale was developed to precisely measure the nature and degree of how people apprehend the future (Lalot et al., 2020). The scale drew from a conceptual model of FC put forward by Ahvenharju et al. (2018) and as such distinguished five dimensions of FC (which we describe below). Despite showing good psychometric properties (fitting the theoretical five-dimension structure as well as showing good internal and external validity), this initial scale suffered from a few limitations. The authors noted that some items proved just satisfactory and might need improvement, and they highlighted that "future work might want to revise and refine some of the scale's items" (Lalot et al., 2020, p. 882). This is the purpose of the present paper. In the following sections, we describe the five-dimension model of FC and highlight where we suggest changing and refining items of the initial FC scale.

Theoretical Background: The Five Dimensions of Futures Consciousness

Ahvenharju et al. (2018) proposed a five-dimensional model of FC encompassing time perspective (TP), agency beliefs (AB), openness to alternatives (OA), system perception (SP), and concern for others (CO) – five dimensions which together form FC. These dimensions were proposed based on a review of the literature in the field of futures research (Ahvenharju et al., 2018) and follow-up work linking it to relevant psychological constructs (Ahvenharju et al., 2021).

Time Perspective

Time perspective (TP) represents the tendency to think not only about the present but also about the past and the future, with an emphasis on long-term thinking and looking ahead. TP hence nonsurprisingly forms a core component of FC. Psychologists have developed several

instruments to measure individual differences in time perceptive, most notably as "future orientation" (Zimbardo & Boyd, 1999) and "consideration for future consequences" (Strathman et al., 1994).

Agency Beliefs

AB, defined as "the subjective sense of being in control of one's future and mindful of the consequences arising from one's actions, as a prerequisite for intentional social action" (Ahvenharju et al., 2018, p. 2), represent a conceptualization of the future as modular and shaped by the actions of active agents (rather than predetermined). This high-level sense of personal agency can be linked to notions of locus of control (Rotter, 1966), general self-efficacy (Bandura, 1982), and optimism (Scheier & Carver, 1985).

Openness to Alternatives

It is assumed in futures studies that there is not one fixed and predetermined future, but rather several potential directions the future may move toward. OA represents an openness of the mind with respect to this uncertainty, and the capacity to "critically evaluate commonly shared views, and to imagine and discover unconventional solutions and alternative paths" (Ahvenharju et al., 2018, p. 2). It is related to neighboring notions of openness to experience (Costa & McCrae, 1992) and critical thinking (Facione et al., 1994).

System Perception

SP reflects individuals' perception of different systems (cultural, societal, and environmental) as related and interconnected. It hence represents a more holistic perspective of the world. SP is not expected to come naturally to most people (Dawidowicz, 2011) and people often overestimate their understanding of complex relations between systems (Rozenblit & Keil, 2002). As conceived in the FC model, SP is related to system thinking (Lezak & Thibodeau, 2016) and holistic thinking (Nisbett et al., 2001) as well as perception of the self as more or less interdependent from other people and nature (Markus & Kitayama, 1991; St. John & MacDonald, 2007).

Concern for Others

Building on systemic understanding, futures studies usually assume that FC should not only represent a consciousness of one own's future, but also a larger representation of the future of others and society in general (Bell, 1997; Malaska, 2001). CO corresponds to this last and most normative dimension of FC. As such, it is related to self-transcendence values (universalism and benevolence; Schwartz et al., 2012) and identification with all of humanity (McFarland et al., 2012).

Relations Between the Five Dimensions

It was expected that FC, as a higher-order factor, would influence the five dimensions together, and indeed, the results of the initial FC scale confirmed (a) the existence of five different factors (with a better fit of the data than a unidimensional construct), (b) the existence of a higher-order dimension with which all five subdimensions correlated significantly, and (c) positive correlations between these dimensions (Lalot et al., 2020).

Overview of the Present Research

Shortcomings of the Original FC Scale

The original FC scale showed good psychometric properties (satisfactory fit of the five-dimension model, good internal and external validity, both convergent and concurrent). However, the authors noted that some items were underperforming and could be adapted further (Lalot et al., 2020). Indeed, their approach was to rely on existing scales and extract relevant items from there, refraining from creating any new ones. While this approach should ensure the face validity and readability of the items (since they come from validated scales), it restricts the range of possibilities to existing scales only. The authors hence noted some difficulty in finding appropriate items, notably for SP, which led to an overweighting of "sense of connection with nature" for this dimension. They also noted inconsistencies in the scales used to measure TP (considerations of future consequences and future orientation).

The Present Research

In the present paper, we adapt and refine the original FC scale by testing additional items and replacing potentially underperforming items. Our aim is to create a revised instrument that replicates the five-dimension structure and shows similarly good psychometric properties as the original instrument while solving its shortcomings. Specifically, our aims are as follows.

New Items Development

Given that the shortcomings of the original FC scale were limited to the TP and SP dimensions, we focused our efforts on creating new items for these two dimensions. The authors met with an expert panel of psychology researchers as well as practitioners and educators in futures studies to discuss new items that would be both readable and presenting good face validity. This led to the creation of six new items, which were considered alongside the 20 original items of the FC scale.

Structural Validity

We rely on a Confirmatory Factor Analysis approach to test the expected five-dimensional structure of FC and consider the following indices to assess the model fit: RMSEA (Steiger & Lind, 1980) and standardized root mean residual (SRMR; Bentler, 1995). Hu and Bentler (1999) advised the use of a "two-index presentation strategy" to minimize both Type I and Type II errors. RMSEA has, moreover, been declared one of the most informative fit indices (Diamantopoulos & Siguaw, 2000). We also report the comparative fit index (CFI; Bentler, 1990) and χ^2. Typically, CFI > .90, RMSEA < .08, and SRMR < .09 indicate an acceptable fit (MacCallum et al., 1996).

Convergent, Discriminant, and Concurrent Validity

To assess convergent and discriminant validity, we tested the relationships between FC scores and personality traits that were hypothesized to be related to FC (see Ahvenharju et al., 2021). Specifically, based on results from the initial scale validation, we expected a positive correlation between OA and the Big Five trait of openness to experience, a positive correlation between CO and agreeableness, and a negative correlation between AB and neuroticism (Lalot et al., 2020). We expected these correlations to be significant but modest, reflecting both interrelations between the constructs (convergent validity) and their theoretical independence (discriminant validity).

We also assessed concurrent validity. FC should facilitate engagement in a variety of behaviors that can be considered future-oriented. We considered here self-reported engagement in collective action and general interest in politics as indicators of active and engaged citizenship (see Zaff et al., 2010), and expected those both to be positively associated with FC scores.

Intended Target Population

The revised FC scale is intended to be suitable for adults without the need for a particular level of education. Low readability of some items has indeed been a criterion for item exclusion since the scale creation. The scale presented here is developed in the English language.

Materials and Methods

Participants and Data Collection

Data were collected as part of a large survey of the political and social views of British people over the course of the summer of 2020. The survey took the form of an online questionnaire, and participants were recruited through an external pool partner to ensure the representativeness of the sample. Participants were adults living in either Scotland, Wales, or the county of Kent in England. These regions were selected to represent a variety of geographical, social, and political landscapes. We aimed for roughly 500 participants from each region. This sample size was arbitrarily decided prior to data collection based on our previous studies to guarantee adequate power as well as representativity. Detailed demographics of the sample (N = 1,684; 743 male, 911 female and 30 undisclosed; M_{age} = 53.35, SD = 15.76) are reported in Electronic Supplementary Material 1 (ESM 1). All analyses reported below rely on two-tailed tests with α level = .05 and were conducted on *R*. All data, as well as code for the analyses, are publicly accessible on the OSF page dedicated to the project at https://osf.io/atwu5.

Materials

Participants answered the 26 items (20 initial items of FC scale + 6 new additions) presented in a randomized order. All items were measured on a 5-point Likert scale (1 = *not true of me at all*, 5 = *very true of me*). For convergent and discriminant validity, participants filled a short version of the Big Five Inventory (Rammstedt & John, 2007) on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). For concurrent validity, we measured their self-reported general interest in politics with a single item ("Generally, how interested are you in politics?" 1 = *not at all interested*, 5 = *very interested*; M = 3.28, SD = 1.19) as well as their engagement in collective action. Participants self-reported whether they had participated in any of 14 actions during the last month (response yes/no, examples include the following: signed a petition, taken part in a strike or demonstration, volunteered, and made a donation). We aggregated their answers in a summed score ranging from 0 (i.e., no action done) to 14 (M = 1.55, SD = 1.97). Demographics were also collected. As stated above, these measures were embedded into a larger survey that also asked about political views, political trust, perception of groups unity and division, discrimination and prejudice, and national identity, which do not fall in the scope of the present paper.

Results

Structural Validity: Ant Colony Optimization and Confirmatory Factor Analysis

We conducted a CFA testing a hierarchical five-factor model where the global construct of FC would be composed of TP, AB, OA, SP, and CO. We started by assessing the model based on the 20 original items, which provided less-than-satisfactory fit, $\chi^2 = 2{,}060$, $df = 165$, $\chi^2/df = 12.48$, CFI = .814, RMSEA = .083, 90% CI [.079, .086], SRMR = .092. Allowing two pairs of items to covary, as suggested by modification indices, improved the model slightly, χ^2 = 1,598, df = 163, χ^2/df = 9.80, CFI = .859, RMSEA = .072, 90% CI [.069, .076], SRMR = .087.

We then relied on an Ant Colony Optimization (ACO) item-sampling procedure to identify the optimal set of items that would fit the theoretical five-factor model and maximize construct validity (Dorigo & Stützle, 2010; Olaru & Danner, 2021). ACO is a "metaheuristic for solving combinatorial optimisation problem" inspired by "the pheromone trail laying and following behaviour of real ants, which use pheromones as a communication medium [...]. The pheromone trails in ACO serve as a distributed, numerical information, which the ants use to probabilistically construct solutions to the problem being solved and which the ants adapt during the algorithm's execution to reflect their search experience" (Dorigo & Stützle, 2010, p. 227).

Analyses were run on *R* with the *stuart* package (Schultze, 2017). We set the parameters based on Olaru et al.'s (2019) recommendations and with respect to our theoretical expectations. Specifically, we asked for a 20-item solution featuring four items per factor of FC and additionally required that model fit was calculated for a five-dimensional structure with a higher-order factor (FC) being composed of the five dimensions. Because it was theoretically important that certain items featured in the new version of the scale, we modified their weighting through the "heuristic" parameters (three items were hence put forward: one for the AB dimension and two for the SP dimension). We calibrated the optimization function to focus on RMSEA, CFI, and McDonald's ω, applying the equation suggested by Olaru et al. (2019, p. 405). Finally and following Olaru et al. (2019)'s recommendations, we split the sample equally into a training and a validation subsample to cross-validate the retained solution and avoid overfitting (using the "holdout" function; see also Schultze, 2017). We ran ACO 10 times with 120 iterations (colonies) and 80 ants per run.

With the current specifications, ACO estimated on average 10,648 models, ranging from 9,680 (seeds = 4 and 7) to 12,560 (seed = 5). The same final solution was achieved in each run and was replicated on average 110 times per run, ranging from 75 (seed = 4) to 209 (seed = 5).

The best selected model yielded a better model fit (CFI = .860; RMSEA = .066) than the original model (CFI = .814, RMSEA = .083), although not fully satisfactory. Modification indices (MI) were then used to identify potentially relevant interitems covariances. Two covariances were identified (MI > 142), both relating pairs of items that contributed to the same subdimension.[1] With these covariances, the final model showed a satisfactory fit, $\chi^2 = 974$, $df = 164$, $\chi^2/df = 5.94$, CFI = .903, RMSEA = .054, 90% CI [.051, .057], SRMR = .049 (see Table 1).[2]

We finally cross-validated the retained solution. The *cross-validate* function from the *stuart* package was used to assess invariance between the training and the validation subsamples. Results confirmed the factorial structure was similar across both samples, in terms of metric invariance ("weak," $\Delta\chi^2 = 20.87$, $\Delta df = 15$, $p = .14$), scalar invariance ("strong," $\Delta\chi^2 = 21.13$, $\Delta df = 20$, $p = .39$), and residual invariance ("strict," $\Delta\chi^2 = 24.37$, $\Delta df = 20$, $p = .23$). All five dimensions were significantly related to the higher-order factor of FC. Descriptive statistics and correlations between the five dimensions are shown in Table 2, while correlations between items are reported in ESM 3 alongside their exact wording in ESM 4.[3]

[1] Specifically, modification indices suggested to let the following pairs of items covary: within agency beliefs: "I hardly ever expect things to go my way" and "I am always optimistic about my future" (MI = 215); and within openness to alternatives: "I often use new ideas to shape (modify) the way I do things" and "I am often on the lookout for new ideas" (MI = 143).

[2] As noted in the ESM, the latent factor of OA showed a nonsignificant negative variance, suggesting that the true variance would be close to zero. We investigated this further and found that the issue seems to arise from the very high relation to the higher-order construct of FC. Indeed, an alternative model of five independent factors with no higher-order factor (see note 3 below) revealed a positive and significant variance of OA (estimate = 0.27, SE = 0.021, z = 12.36, $p < .001$). It seems that introducing the FC factor explained a considerable part of the variance of OA, resulting in a nonsignificant remaining variance.

[3] The five-factor solution was theory-driven. To ensure it was completely sound in relation to the data, we ran a Horn's parallel analysis to estimate the numbers of factors to be extracted, based on the retained 20 items (method of extraction: maximum likelihood, eigenvalues based on principal axis factor analysis). In line with our expectations, the analysis suggests extracting five factors. We additionally used likelihood ratio tests to compare the model fit to alternative models (i.e., five independent factors, single factor, and the independence model), which confirmed our final model was a best fit to the data than any of the alternative models (comparisons in order; single factor vs. independence model: $\Delta\chi^2$ ($\Delta df = 22$) = 6,560, $p < .001$; five independent factors versus single factor: $\Delta\chi^2$ ($\Delta df = 10$) = 1,057, $p < .001$; five correlated factors with higher-order FC versus five independent factors: $\Delta\chi^2$ ($\Delta df = 6$) = 44, $p < .001$).

Table 1. Results of the CFA testing the structure of the revised FC scale

	Estimate	*SE*	*z*	*p*	Standardized estimate
Time perspective (TP)					
TP1	1.00				0.396
TP2	1.22	0.097	12.66	<.001	0.529
TP3*	1.30	0.112	11.66	<.001	0.445
TP4*	1.94	0.138	14.09	<.001	0.744
Agency beliefs (AB)					
AB1	1.00				0.826
AB2	−0.53	0.045	−11.83	<.001	−0.372
AB3	0.48	0.032	14.94	<.001	0.497
AB4*	0.75	0.049	15.18	<.001	0.516
Openness to alternatives (OA)					
OA1	1.00				0.614
OA2	1.09	0.045	24.37	<.001	0.610
OA3	1.06	0.051	20.89	<.001	0.660
OA4	−0.66	0.061	−10.81	<.001	−0.300
Systems perception (SP)					
SP1	1.00				0.554
SP2	0.99	0.064	15.49	<.001	0.499
SP3*	0.87	0.048	17.99	<.001	0.627
SP4*	0.95	0.055	17.49	<.001	0.598
Concern for others (CO)					
CO1	1.00				0.693
CO2	1.04	0.050	20.94	<.001	0.650
CO3	1.22	0.059	20.50	<.001	0.631
CO4	0.94	0.050	18.97	<.001	0.570
Higher-order futures consciousness (FC)					
TP	1.00				0.881
AB	1.40	0.122	11.54	<.001	0.538
OA	1.79	0.138	12.99	<.001	0.998
SP	1.73	0.142	12.17	<.001	0.903
CO	1.23	0.101	12.15	<.001	0.680
Covariances					
AB2 ~~ AB4	−0.35	0.027	−12.62	<.001	−0.378
OA1 ~~ OA2	0.16	0.015	10.60	<.001	0.324

Note. Items marked by an asterisk * are new items, replacing older items from the original FC scale. Variance estimates of items and latent variables, and the proportion of variance explained (R^2) are reported in ESM 2.

Demographics Differences

We tested whether gender, age, income, subjective socioeconomic status, and political orientation would relate to the FC score (average aggregated score of the 20 items). Results of a multiple linear regression (overall model: $F(5, 1{,}428) = 16.02$, $p < .001$, $R^2_{adj} = .050$) indicated significant albeit small effects of gender so that women reported higher FC scores than men, $b = 0.06$, $SE = 0.012$, $\beta = .13$, $t(1{,}428) = 4.58$, $p < .001$; income, $b = 0.03$, $SE = 0.013$, $\beta = .07$, $t(1{,}428) = 2.31$, $p = .021$, and subjective status, $b = 0.07$, $SE = 0.014$, $\beta = .16$, $t(1{,}428) = 5.42$, $p < .001$, so that respondents with higher income and higher status reported a higher FC score. There was also an effect of political orientation so that more left-wing participants reported higher FC score, $b = -0.04$, $SE = 0.012$, $\beta = -.09$, $t(1{,}428) = -3.37$, $p = .001$. Finally, there was no effect of age, $b = -0.002$, $SE = 0.013$, $\beta = -.01$, $t(1{,}428) = -0.18$, $p = .86$.

Table 2. Descriptive statistics and correlations between the five dimensions of FC (scores reflect the manifest variables)

		Pearson's correlations				
	M (*SD*)	TP	AB	OA	SP	CO
TP	3.61 (0.57)	—				
AB	3.34 (0.69)	.22***				
OA	3.38 (0.64)	.51***	.28***			
SP	3.53 (0.65)	.47***	.27***	.60***		
CO	3.74 (0.64)	.45***	.15***	.43***	.45***	
FC	3.52 (0.45)	.73***	.62***	.79***	.79***	.69***

Note. AB = agency beliefs, CO = concern for others, FC = future consciousness, OA = openness to alternatives, SP = systems perception, TP = time perspective.
* $p < .05$, ** $p < .01$, *** $p < .001$.

Convergent and Discriminant Validity

Results revealed significant correlations between the five dimensions of FC and most personality traits from the Big Five Inventory (see Table 3), which were consistent with theoretical considerations. Notably, AB were negatively correlated with neuroticism ($r(1,615) = -.535$, $p < .001$), CO was positively correlated with agreeableness ($r(1,611) = .275$, $p < .001$), and OA was positively correlated with openness to experience ($r(1,610) = .347$, $p < .001$). Yet, most correlation coefficients were modest. At the exception of the correlation between AB and neuroticism, no correlation exceeded |.35|.

Concurrent Validity

As expected, the average FC score was positively associated with self-reported engagement in collective action, $b = 0.66$, $SE = 0.065$, Wald's $\chi^2(1) = 102.31$, $p < .001$. It was also positively associated with general interest in politics, $b = 0.64$, $SE = 0.054$, $\beta = .27$, $t(1,768) = 11.83$, $p < .001$. All results hold when demographics were introduced as covariates.

Measurement Invariance Across Groups

Finally, we conducted multiple-group CFA to assess measurement (in)variance across the three regional samples. Although the model had been developed in the entire sample, it was important to check whether some loadings differ between regions. We sequentially tested for configural, metric, and scalar invariance (see, e.g., Hirschfeld & von Brachel, 2014; Vandenberg & Lance, 2000). Changes in likelihood ratio tests are often reported to assess differences between the unconstrained model and models with measurement invariances constraints. However, χ^2 has been criticized for depending too much on the sample size, and authors (Cheung & Rensvold, 2002) have proposed to also consider differences in three other incremental indices: CFI, Steiger's gamma hat (GH), and McDonald's noncentrality index (NCI). Differences in nested models should be <.01, .01, and .02, respectively (see also Milfont & Fischer, 2010). When considering differences in CFI, GH, and NCI (see Table 4), analyses supported full configural invariance (Model 1), full metric invariance (Model 2), full scalar invariance (Model 3), and strict invariance (Model 4). In other words, the revised FC scale behaved in a similar way in all three regional samples.

Discussion

The five-dimensional model of FC is a relatively new concept in the fields of futures studies and psychology. However, recent evidence indicates it could be a useful concept to apprehend and predict people's differential engagement with the future and their future-oriented behaviors. With this paper, we develop and test the revised FC scale, which captures such interindividual differences. This revised scale is an improvement of the initial FC scale (Lalot et al., 2020) in that it solves some issues of underachieving items and a dimension of

Table 3. Correlations between the five dimensions of FC and personality traits from the Big Five Inventory

	Big Five Inventory				
	Openness	Conscientiousness	Extraversion	Agreeableness	Neuroticism
TP	.15***	.20***	−.03	.04	.03
AB	.05*	.29***	.35***	.23***	−.54***
OE	.35***	.18***	.15***	.09**	−.05*
SP	.28***	.14***	.13***	.09**	−.08**
CO	.15***	.19***	.11***	.28***	.05*
FC	.28***	.29***	.21***	.21***	−.18***

Note. AB = agency beliefs, CO = concern for others, FC = future consciousness, OA = openness to alternatives, SP = systems perception, TP = time perspective.
* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 4. Test of measurement invariance across groups

Model	χ^2	*df*	χ^2/df	CFI	GH	NCI	RMSEA [90% CI]	SRMR	Comparison	$\Delta\chi^2$	ΔCFI	ΔGH	ΔNCI	Decision
(1) Configural model	1,394	492	2.83	.894	.949	.765	.057 [.051, .061]	.054	—	—	—	—	—	Accept
(2) Metric invariance	1,459	530	2.75	.891	.948	.759	.056 [.052, .059]	.060	Model 2 vs. 1	65 (38)***	.003	.001	.006	Accept
(3) Scalar invariance	1,505	558	2.70	.888	.947	.755	.055 [.052, .058]	.061	Model 3 vs. 2	46 (28)*	.003	.001	.004	Accept
(4) Strict invariance	1,552	598	2.60	.888	.946	.753	.053 [.050, .057]	.062	Model 4 vs. 3	47 (40) ns	0	.001	.002	Accept

Note. CFI = comparative fit index, GH = gamma hat, NCI = non-centrality index, SRMR = standardized root mean residual. Each difference test (Δ) compares the model on its line with the previous one.
* $p < .05$, ** $p < .01$, *** $p < .001$.

Systems perception that relied too heavily on connection with nature. Data from a representative British sample showed good psychometric properties of the scale, fitting the theorized five-dimensional structure. Scores were significantly but moderately correlated with different relevant dimensions of personality, highlighting the convergent and discriminant validity of the scale. Importantly, the revised scale was associated with future-oriented civic behavior in the form of greater self-reported engagement in collective action and general interest in politics, hence replicating the initial results of the original scale.

Limitations and Avenues for Future Research

Multiple-group analyses supported full measurement invariance between the three regional samples (Scotland, Wales, and the English county of Kent). These regions were selected because they represent quite different geographical, social, and political landscapes within the United Kingdom. However, this sample remained limited to a single nation. Future studies will need to test how the scale behaves in other places, most notably in non-Western contexts. As originally noted by Lalot et al. (2020), the scale might be bound to cultural variations (notably Systems thinking and CO), but this remains to be tested (e.g., Heine et al., 1999; Nisbett et al., 2001).

In addition, this revision focused on the subdimensions of TP and SP, as those had been identified by the original authors as slightly underperforming (Lalot et al., 2020). Yet, it could have been interesting to also consider the three other dimensions as there is certainly room for improvement there as well. Future research might want to investigate these further and could, for example, rely on item response theory to better assess the relative "difficulty" of each item and refine the measurement accordingly (see, e.g., Embretson & Reise, 2000).

Finally, we primarily construed FC as an individual (and hence presumably stable) difference. This, however, does not mean that FC cannot be taught or improved. Practitioners in future studies have developed futures workshops that aim to improve participants' skills in dealing with the future (e.g., strategic planning, scenario development, or educational goals; see Jungk & Mullert, 1987; Miller, 2015). These workshops and other forms of training (e.g., learning to engage in episodic future thinking; Altgassen et al., 2015; or improving critical thinking; King & Kitchener, 1994) should theoretically improve FC, and the revised FC scale should be able to capture such personal changes.

How Can the Revised FC Scale Scores Be Used?

There are different ways in which the revised FC scale scores can be used. First, researchers can find it a useful tool to predict respondents' propensity to engage in future-oriented behavior (e.g., proenvironmental or civic behavior; see also Lalot et al., 2021, for recent findings on the protective effect of heightened FC in the COVID-19 pandemic). Second, it can serve as an indicative tool indicating a person's strengths and weaknesses across the five dimensions of time perspective, agency beliefs, openness to alternatives, systems perception, and concern for others, identifying which dimension might need to be strengthened (see, for example, the FC Profiles Database: https://futuresconsciousness.utu.fi). Third, the scale could be used to measure individual changes through time, assessing, for example, the impact of a futures workshop on participants' engagement with the futures – although further investigation is needed to estimate how sensible the scale is to such pre-/postvariations. Finally, the scale could be used to measure the impacts of futures education on the development of participating individuals' FC. In conclusion, we believe the revised FC scale has the potential to be a reliable and useful tool that can suit many purposes for both researchers and practitioners.

Electronic Supplementary Material

The electronic supplementary material is available with the online version of the article at https://doi.org/10.1027/2698-1866/a000014

ESM 1. Demographics of each region subsample
ESM 2. CFA results
ESM 3. Descriptive statistics and correlations of revised FC scale items
ESM 4. Items of the revised FC scale

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