Data Quality Analysis

Reliability and Validity Analysis

Firstly, we conduct reliability analysis.

Table A Reliability analysis of cognitive flexibility scale

Scale	Items	CITC	Cronbach's α after item deletion	Cronbach's α
alternatives	alt1	0.736	0.926	0.932
	alt2	**0.211**	**0.942**	
	alt3	0.762	0.925	
	alt4	0.696	0.927	
	alt5	0.706	0.927	
	alt6	0.752	0.925	
	alt7	**0.244**	**0.941**	
	alt8	0.752	0.925	
	alt9	0.782	0.924	
	alt10	0.863	0.922	
	alt11	0.812	0.923	
	alt12	0.841	0.922	
	alt13	0.851	0.922	
control	con1	0.680	0.847	0.870
	con2	0.591	0.859	
	con3	0.810	0.829	
	con4	0.806	0.829	
	con5	**0.322**	**0.889**	
	con6	0.671	0.848	
	con7	0.650	0.851	

The Cronbach's α of alternatives and control are 0.932 and 0.870 severally, which are larger than zero point eight, showing that the reliability of this scale is benign.

The CITC values of items alt2 and alt7 of the alternatives scale are less than zero point four. After deleting these two items, the Cronbach's α will increase, reminding us that it is sensible to delete the two items.

The CITC value of the item con5 of the control scale is lower than zero point four. When the item is deleted, the Cronbach's α will increase from 0.870 to 0.889, indicating that it is sensible to strike it out.

Table B Reliability analysis of entrepreneurial self-efficacy scale

Scale	Items	CITC	Cronbach's α after item deletion	Cronbach's α
Entrepreneur-ial self-efficacy	ents1	0.753	0.846	0.877
	ents2	0.827	0.835	

scale	ents3	0.657	0.862	
	ents4	0.715	0.851	
	ents5	0.565	0.875	
	ents6	0.637	0.866	

The Cronbach's α of entrepreneurial self-efficacy scale is 0.877, bigger than zero point eight, showing that the reliability of the scale tends to be ideal.

As for CITC value, all the measurement items of the scale are larger than zero point four. Striking out any item cannot further promote Cronbach's α of this scale. Therefore, there is no need to strike out any item.

Table C Reliability analysis of optimism scale

Scale	Items	CITC	Cronbach's α after item deletion	Cronbach's α
optimism	opt1	0.742	0.869	0.893
	opt2	0.790	0.861	
	opt3	0.568	0.897	
	opt4	0.849	0.851	
	opt5	0.643	0.884	
	opt6	0.699	0.876	

The Cronbach's α of the scale is 0.893, higher than zero point eight, showing that the reliability of this scale is favorable.

As for CITC value, all the measurement items of the scale are larger than zero point four. Striking out any item cannot further promote Cronbach's α coefficient of this scale. Hence there is no need to strike out any item.

Table D Reliability analysis of entrepreneurship competence scale

Scale	Items	CITC	Cronbach's α after item deletion	Cronbach's α
opportunity ability	oppa1	0.734	0.793	0.854
	oppa2	0.698	0.830	
	oppa3	0.757	0.767	
commitment ability	coma1	0.726	0.755	0.835
	coma2	0.661	0.816	
	coma3	0.721	0.747	
conception ability	cona1	0.621	0.786	0.813
	cona2	0.680	0.727	
	cona3	0.690	0.714	
financing ability	fina1	0.725	0.880	0.884
	fina2	0.821	0.795	
	fina3	0.781	0.830	
operation ability	opea1	0.583	0.695	0.763
	opea2	0.758	0.591	

Opea3	**0.359**	**0.815**
opea4	0.592	0.697

The Cronbach's α of opportunity ability, commitment ability, conception ability, financing ability, and operation ability scales are 0.854, 0.835, 0.813, 0.884, and 0.763 respectively, which are greater than or close to zero point eight, suggesting that the reliability of these scales is favorable.

The CITC value of the item opea3 of the operation ability scale is lower than zero point four. When the item is struck out, the Cronbach's α coefficient increases, indicating that it is sensible to reject the item.

The CITC value of all measurement items of the rest of the scales are larger than zero point four. Deleting any item cannot further improve the Cronbach's α coefficient of this scale. Consequently, it is not essential to reject the rest of the items.

Then we conduct validity analysis. Start with exploratory factor analysis.

Table E KMO and Bartlett test of cognitive flexibility scale

KMO sampling suitability quantity		0.943
Bartlett's spherical test	Last read chi square	4344.263
	Degree of freedom	136
	Significance	0.000

KMO value is 0.943, bigger than zero point five; the statistical value of Bartlett's spherical test is 4344.263, and the p value acquired by analysis is 0.000, which is lower than the significance level of five percent, suggesting that this scale is appropriative for factor analysis.

Table F Factor analysis result of cognitive flexibility scale

	Factor	
	1	2
alt1	**0.729**	0.214
alt3	**0.777**	0.226
alt4	**0.737**	0.140
alt5	**0.749**	0.147
alt6	**0.794**	0.106
alt8	**0.792**	0.107
alt9	**0.800**	0.198
alt10	**0.897**	0.158
alt11	**0.845**	0.218
alt12	**0.878**	0.172
alt13	**0.882**	0.189
con1	0.171	**0.792**
con2	0.269	**0.680**
con3	0.150	**0.866**
con4	0.153	**0.866**
con6	0.130	**0.766**
con7	0.125	**0.739**

Eigenvalue	7.384	4.062
Variance percentage	43.433	23.896
Cumulative %	43.433	67.329

In accordance with the standard that the cumulative contribution rate should be larger than sixty percent and the eigenvalue exceeds one, two main factors could be extracted from the 17 items of this scale. The cumulative variance contribution rate of the two main factors is 67.329%, indicating that there is little information to be removed and the result of factor analysis is trusty.

alt1, alt3, alt4, alt5, alt6, alt8, alt9, alt10, alt11, alt12, and alt13 have a large load on factor 1, so they can be named alternatives factor; con1, con2, con3, con4, con6, and con7 have a large load on factor 2, which can be named control factor. Each factor load is greater than zero point five, and each item does not have serious cross load. Each measurement item is clustered under the corresponding factor, so it indicates that the scale tends to have ideal structural validity.

Table G KMO and Bartlett test of entrepreneurial self-efficacy scale

KMO sampling suitability quantity		0.890
Bartlett's spherical test	Last read chi square	998.623
	Degree of freedom	15
	Significance	0.000

KMO value is 0.890, higher than zero point five; the statistical value of Bartlett's spherical test is 998.623, and the p value acquired by analysis is 0.000, which is lower than the significance level of five percent, suggesting that this scale tends to be appropriate for factor analysis.

Table H Factor analysis result of entrepreneurial self-efficacy scale

	Factor 1
ents1	0.848
ents2	0.900
ents3	0.769
ents4	0.816
ents5	0.686
ents6	0.749
Eigenvalue	3.817
Variance percentage	63.620
Cumulative %	63.620

One main factor could be extracted from the six items of this scale. The cumulative variance contribution rate of this main factor is 63.620%, which indicates that there is little information to be eliminated; meanwhile, the result of factor analysis is faithful. Each factor load is higher than zero point five, so it suggests that this scale tends to have good structural validity.

Table I KMO and Bartlett test of optimism scale

KMO sampling suitability quantity		0.894
Bartlett's spherical test	Last read chi square	1104.28
	Degree of freedom	15
	Significance	0.000

KMO value is 0.894, higher than zero point five; the statistical value of Bartlett's spherical test reaches 1104.28, and the p value acquired by analysis is 0.000, which is lower than the significance level of five percent, which indicates that this scale tends to be appropriate for factor analysis.

Table J Factor analysis result of optimism scale

	Factor 1
opt1	0.832
opt2	0.868
opt3	0.680
opt4	0.909
opt5	0.750
opt6	0.797
Eigenvalue	3.931
Variance percentage	65.513
Cumulative %	65.513

One main factor can be refined from the six items of this scale. The cumulative variance contribution rate of this main factor is 65.513%, which indicates that there is little information to be eliminated, and the result of factor analysis is trusty. Each factor load is larger than zero point five, hence it suggests that this scale tends to have favorable structural validity.

Table K KMO and Bartlett test of entrepreneurship competence scale

KMO sampling suitability quantity		0.856
Bartlett's spherical test	Last read chi square	2634.925
	Degree of freedom	105
	Significance	0.000

KMO value is 0.856, bigger than zero point five; the statistical value of Bartlett's spherical test is 2634.925, and the p value acquired by analysis is 0.000, which is lower than the significance level of five percent, showing that this scale tends to be ideal for factor analysis.

Table L Factor analysis result of entrepreneurship competence scale

	Factor				
	1	2	3	4	5
oppa1	0.117	0.211	**0.828**	0.188	0.115
oppa2	0.073	0.160	**0.816**	0.083	0.241
oppa3	0.151	0.292	**0.801**	0.167	0.141
coma1	0.160	**0.777**	0.270	0.035	0.231
coma2	0.021	**0.790**	0.219	0.152	0.200

coma3	0.199	**0.838**	0.175	0.018	0.172
cona1	0.145	0.372	0.061	0.116	**0.724**
cona2	0.111	0.228	0.218	0.024	**0.795**
cona3	0.186	0.079	0.203	0.056	**0.847**
fina1	**0.840**	0.108	0.161	0.050	0.249
fina2	**0.856**	0.117	0.137	0.272	0.111
fina3	**0.824**	0.165	0.039	0.329	0.101
opea1	0.372	0.065	0.080	**0.731**	0.031
opea2	0.157	0.020	0.160	**0.869**	0.028
opea4	0.098	0.107	0.146	**0.837**	0.106
Eigenvalue	2.465	2.351	2.338	2.286	2.185
Variance percentage	16.433	15.671	15.585	15.242	14.568
Cumulative %	16.433	32.105	47.689	62.932	77.499

Five main factors could be refined from the 15 items of this scale. The cumulative variance contribution rate of the five main factors is 77.499%, which indicates that there is little information to be eliminated; the result of factor analysis is trusty.

oppa1-oppa3 has a large load on factor 3, which can be named opportunity ability factor; coma1-coma3 has a large load on factor 2, so it can be named commitment ability factor; cona1-cona3 has a large load on factor 5, so it can be named as conception ability factor; fina1-fina3 has a large load on factor 1, which can be named financing ability factor; opea1, opea2, and opea4 have a large load on factor 4, so they can be named opportunity ability factor. Each factor load is greater than zero point five, and each item does not have serious cross load. Each measurement item is clustered under the corresponding factor, so it shows that this scale has good structural validity.

Then we perform confirmatory factor analysis.
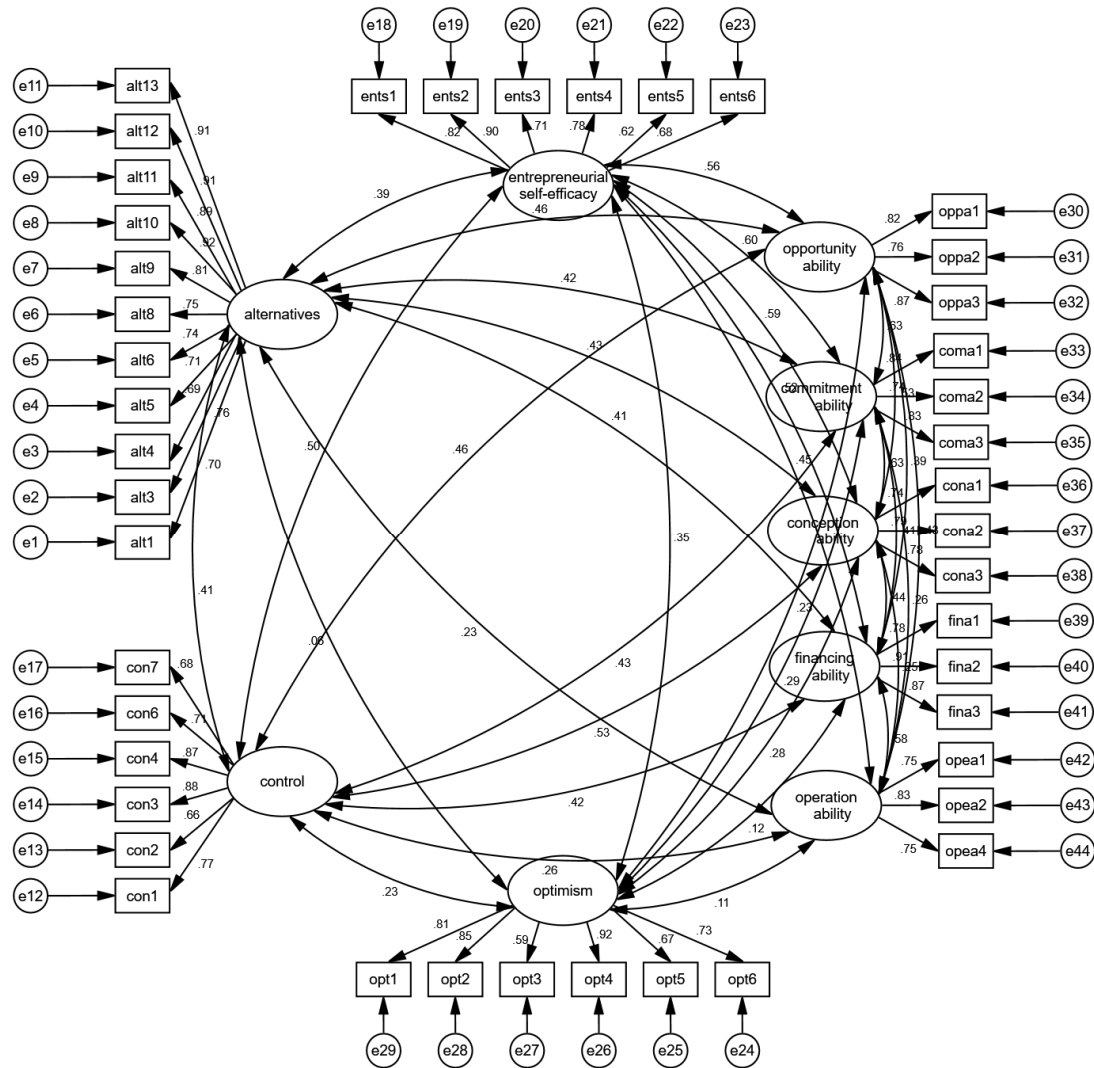
Figure A Confirmatory factor analysis

Table M Model fitting index of the scale

Index	Absolute fit index		Incremental fit index			Parsimony fit index	
Specific classification	X²/df	RMSEA	IFI	TLI	CFI	PGFI	PNFI
Judgment criteria	<5	<0.08	>0.9	>0.9	>0.9	>0.5	>0.5
Fitness effect	1.722	0.047	0.935	0.929	0.935	0.722	0.786

From the absolute fitting index, X^2/df value is 1.722, lower than five. RMSEA value is 0.047, lower than zero point zero eight. The absolute fitting index is ideal. In terms of incremental fit index, the value of IFI is 0.935, which is larger than zero point nine. The value of TLI is 0.929, bigger than zero point nine. The value of CFI is 0.935, greater than zero point nine. The fitting of incremental fit index is ideal. In terms of parsimony fitting index, the value of PGFI is 0.722, which is greater than zero point five. The value of PNFI is 0.786, greater than zero point five. The parsimony fitting index is ideal. Overall, the index

adaptation of the scale is ideal.

Table N Convergent validity of the scale

Dimension	Item	Standardized factor load	CR	AVE
alternatives	alt1	0.705	0.953	0.650
	alt3	0.761		
	alt4	0.693		
	alt5	0.712		
	alt6	0.743		
	alt8	0.751		
	alt9	0.812		
	alt10	0.921		
	alt11	0.892		
	alt12	0.914		
	alt13	0.909		
control	con1	0.768	0.893	0.584
	con2	0.656		
	con3	0.877		
	con4	0.870		
	con6	0.705		
	con7	0.679		
entrepreneurial self-efficacy	ents1	0.823	0.888	0.573
	ents2	0.897		
	ents3	0.707		
	ents4	0.777		
	ents5	0.623		
	ents6	0.683		
optimism	opt1	0.811	0.895	0.593
	opt2	0.848		
	opt3	0.595		
	opt4	0.921		
	opt5	0.667		
	opt6	0.730		
opportunity ability	oppa1	0.821	0.859	0.670
	oppa2	0.765		
	oppa3	0.866		
commitment ability	coma1	0.838	0.843	0.643
	coma2	0.737		
	coma3	0.826		
conception ability	cona1	0.736	0.643	0.596
	cona2	0.795		
	cona3	0.784		
financing ability	fina1	0.779	0.888	0.725

	fina2	0.905		
	fina3	0.866		
	opea1	0.748		
operation ability	opea2	0.833	0.822	0.607
	opea4	0.753		

The standardized load value of each item of the scale of alternatives, control, entrepreneurial self-efficacy, optimism, opportunity ability, commitment ability, conception ability, financing ability, and operation ability is larger than zero point five, meeting the standard. The CR values are 0.953, 0.893, 0.888, 0.895, 0.859, 0.843, 0.643, 0.888, and 0.822, all higher than 0.6; the values of AVE are 0.650, 0.584, 0.573, 0.593, 0.670, 0.643, 0.596, 0.725, and 0.607, which are bigger than zero point five, which indicates that the convergent validity of this scale tends to be up to standard.

Common Method Variance Analysis

Common method variance is likely to refer to the artificial covariance between prediction variables and standard variables brought about by the same data sources or rater, the same measurement atmosphere, project contexts, and the nature of the projects themselves. Such an artificial covariance may seriously confuse the research result and potentially mislead the conclusion, which tends to be a kind of systematic error. Harman single factor test is adopted to check whether there is a common method variance. There are two judgment criteria for common method variance: only one factor could be extracted; multiple factors could be extracted, however, the variance interpretation rate of the first factor is higher than forty percent.

Table O Common method variance test

| Compone nt | Initial eigenvalue | | | Extraction sums of squared loadings | | |
	Total	Variance percentage	Cumulative %	Total	Variance percentage	Cumulative %
1	13.793	31.347	31.347	13.793	31.347	31.347
2	5.011	11.388	42.735	5.011	11.388	42.735
3	3.109	7.066	49.802	3.109	7.066	49.802
4	2.401	5.458	55.259	2.401	5.458	55.259
5	1.996	4.537	59.797	1.996	4.537	59.797
6	1.579	3.590	63.386	1.579	3.590	63.386
7	1.364	3.100	66.487	1.364	3.100	66.487
8	1.073	2.439	68.926	1.073	2.439	68.926
9	1.020	2.318	71.244	1.020	2.318	71.244

Factor analysis is carried out on all items requiring subjects to answer. The results show that the eigenvalues of nine factors are higher than one, and the cumulative total contribution rate reaches 71.244%. The variance interpretation rate of the first factor is 31.347, smaller than forty percent, indicating that common method variance does not exist within our research.

Descriptive Analysis

Skewness is regarded as a measurement of the skew direction and degree of statistical

data distribution, and a digital feature of the degrees of asymmetry of statistical data distribution. Kurtosis is viewed as a statistic that can describe the steepness and slowness of all value distribution patterns in the population.

Table P Descriptive analysis

	Number	Minimum	Maximum	Average	Standard deviation	Skewness	Kurtosis
cognitive flexibility	323	1	5	3.630	0.754	-1.280	2.362
alternatives	323	1	5	3.705	0.925	-1.033	1.309
control	323	1	5	3.491	0.785	-0.533	0.441
entrepreneurial self-efficacy	323	2	5	3.711	0.693	-0.417	0.139
optimism	323	1	5	3.790	0.725	-1.451	3.521
entrepreneurship competence	323	1.8	5	3.694	0.573	-1.201	2.212
opportunity ability	323	1	5	3.905	0.819	-0.979	1.360
commitment ability	323	2	5	3.683	0.781	-0.442	-0.311
conception ability	323	1	5	3.620	0.819	-0.753	0.658
financing ability	323	1	5	3.723	0.812	-1.067	1.407
operation ability	323	2	5	3.540	0.765	-0.367	-0.582

The mean value of every variable is larger than three, showing that the scores of these variables are high. The absolute value of skewness of every variable is lower than three and the absolute value of kurtosis is lower than ten, suggesting that these variables roughly conform to the normal distribution.

Correlation Analysis

The degree of correlation between the two variables tends to be described by the correlation coefficient r. The value of the correlation coefficient r is between minus one and one, but it can be any value in this range.

Table Q Correlation analysis

	1	2	3	4	5	6	7	8	9
1. alternatives	1								
2. control	0.404**	1							
3. entrepreneurial self-efficacy	0.365**	0.494**	1						
4. optimism	0.050	0.226**	0.335**	1					
5. opportunity ability	0.423**	0.438**	0.512**	0.225**	1				
6. commitment ability	0.386**	0.386**	0.533**	0.259**	0.533**	1			
7. conception ability	0.382**	0.482**	0.527**	0.232**	0.453**	0.530**	1		
8. financing ability	0.403**	0.409**	0.505**	0.075	0.341**	0.354**	0.398**	1	
9. operation ability	0.224**	0.247**	0.403**	0.102	0.352**	0.234**	0.219**	0.494**	1

***, * *, * represent P < 0.001, P < 0.01, P < 0.05, respectively

All variables are positively correlated; meanwhile, the correlation coefficients are less than zero point eight, which indicates that multicollinearity problem does not exist between variables.