




## Research Article

# Cognitive flexibility and entrepreneurial self-efficacy of the leaders of the young entrepreneurs' alliance and the ibero-american federation of young entrepreneurs

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## Abstract

**Objective:** Assess the relationship between Cognitive Flexibility, with its subscales, and Entrepreneurial Self-efficacy, with its dimensions, of the leaders representing young entrepreneurs in the G20 Young Entrepreneurs Alliance and the Ibero-American Federation of Young Entrepreneurs. **Methodology:** The study has qualitative and quantitative approaches, as well as a descriptive nature. The analytical and statistical processing was the Qualitative Comparative Analysis of Fuzzy Sets (fsQCA) and Correlation and Linear Regression. **Results:** the results showed a significant positive correlation in hypotheses H2, H3 and H4, and rejected hypothesis H1, thus concluding that these leaders maintain the dexterity in perceiving and generating multiple explanations and alternative solutions for uncertain, difficult and/or new occurrences (cognitive flexibility), positively influencing the belief that your skills are effective to take courses of action necessary for the creation of a new business or the development of an existing company (entrepreneurial self-efficacy). **Theoretical/methodological contributions:** The study contributes to the literature by expanding knowledge about the relationship between cognitive flexibility and entrepreneurial self-efficacy, as well as the research sample formed by world leaders and the use of the fsQCA technique. **Relevance/Originality:** The research deepens the discussion on the cognitive flexibility and entrepreneurial self-efficacy of young entrepreneur leaders, as the way entrepreneurs think, and act has become an indispensable issue to support entrepreneurial activities carried out independently or within organizations. **Social contributions:** The contribution is in the evidence that there is a significant positive relationship between cognitive flexibility, which is an important problem-solving skill, along with entrepreneurial self-efficacy to understand the strategies that entrepreneurs share with each other.

**Keywords:** Cognitive flexibility. Entrepreneurial self-efficacy. Young entrepreneurs.

## Resumo

**Objetivo:** Avaliar a relação entre a flexibilidade cognitiva (FC) (e suas subescalas) e a autoeficácia empreendedora (AE) (e suas dimensões) dos jovens líderes representantes da Aliança de Jovens Empreendedores do G20 e da Federação Ibero-americana de Jovens Empresários. **Metodologia:** Este estudo, de natureza descritiva, tem abordagem qualitativa e quantitativa, sendo o seu processamento analítico e estatístico pautado na análise qualitativa comparativa de conjuntos difusos (fsQCA) e na correlação e regressão linear. **Resultados:** Os resultados apontaram correlação positiva significativa entre a flexibilidade cognitiva (destreza dos referidos líderes em perceber e gerar múltiplas explicações e soluções alternativas para ocorrências incertas, difíceis e/ou novas) e a autoeficácia empreendedora (a crença de que suas habilidades são eficazes para realizar ações necessárias à criação de um novo negócio ou o aprimoramento de uma empresa já existente). **Contribuições teóricas/metodológicas:** O estudo amplia o conhecimento sobre a relação entre a flexibilidade cognitiva e a autoeficácia empreendedora, por meio do emprego da técnica fsQCA, na amostra da pesquisa formada por líderes mundiais. **Relevância/Originalidade:** A pesquisa aprofunda a discussão sobre a flexibilidade cognitiva e a autoeficácia empreendedora de jovens líderes empreendedores, visto que a forma como eles pensam e agem se tornou uma questão indispensável ao apoio de atividades empreendedoras independentes ou realizadas nas organizações. **Contribuições sociais:** A evidência de que há relação positiva significativa entre a flexibilidade cognitiva (habilidade importante para a solução de problemas) e a autoeficácia empreendedora, para compreender as estratégias utilizadas por jovens empreendedores.

**Palavras-chave:** Flexibilidade cognitiva. Autoeficácia empreendedora. Jovens empreendedores.

## INTRODUCTION

The companies and the individual entrepreneurial forms (Microentrepreneur or Individual Entrepreneur) are manifested by people who glimpse opportunities to generate products and/or provide services that meet the needs of consumers. In this step, entrepreneurs seek to create value to their products and/or services that differentiate them from other competitors, in order to obtain sustainable competitive advantage. In the conception of Barbosa, et al., (2020, p. 130), "[...] an entrepreneur is every player that contributes to business innovation and growth, whether corporate or social entrepreneurship. This occurs, specifically, through the recognition and exploration of opportunities, innovation and value creation in a given market".

However, achieving the desired sustainable competitive advantage is difficult, as business strategies face frequent challenges due to global influences and changes in the business environment (Camozzato, et al., 2017). The global environment permeated by constant market turbulence, such as potential competition, currency devaluation, increase in interest rates, and currency fluctuations, influences the achievement of an advantageous market position, without which an organization cannot maintain competitiveness (Guimarães, et al., 2017).

In 2010, the G20 YEA - Young Entrepreneurs' Alliance was created, a global alliance of young entrepreneurs and the organizations that support them, which meets every year before the G20 Summit, in order to defend, together with the member countries of the Summit, the importance of more than 500,000 entrepreneurs between 18 and 34 years old, recognized as powerful drivers of economic renewal, job creation, innovation and social change (G20 YEA, 2019).

In the same vein, but at regional and national levels, there are the IberoAmerican Federation of Young Entrepreneurs (IFYE), created in the year 2008 with the mission "to represent the national entities of young entrepreneurs in Latin America in the search for a favorable environment for the achievement of their objectives" (Fije, 2019); and the National Confederation of Young Entrepreneurs (CONAJE), created in 2000 with the mission to "represent, integrate and inspire young entrepreneurs and their organizations, strengthening the Brazilian entrepreneurial environment, developing new leaderships and contributing to the country's growth" (Conaje, 2019).

The aforementioned collegiate bodies of young entrepreneurs have the prerogative to discuss, equalize and deliberate on the varied problems that affect them, such as: the lack of skills and/or previous experience that may limit the chances of success of these emerging entrepreneurs; as well as the same problems of entrepreneurship that adults face, i.e. bureaucracy, import/export, high taxes, lack of institutional support for training and information, as well as the difficulty in accessing resources, including microcredit (Ribeiro and Teixeira, 2012).

The business associations that are members of collegiate bodies are represented by their leaders, who know and experience the reality common to the young entrepreneurs they represent, as well as sustain cognitive skills that allow them to debate and decide on behalf of their target audience in face of dynamic market situations. The deliberative meetings take place in assemblies and congresses, such as the G20 YEA Leaders Assembly, the IFYE Ibero-American Congress of Young Entrepreneurs, and the CONAJE National Congress of Young Entrepreneurs.

It is in these deliberative settings that we seek to extract data on certain cognitive abilities of G20 YEA and IFYE leaders, as psychic attributes are becoming increasingly relevant to career researchers, educators, and policymakers. In World Economic Forum reports (2009; 2016), Entrepreneurial Self-efficacy (ESE) and Cognitive Flexibility (CF) have been listed as important

skills and capabilities for meeting the global challenges of the 21st century.

To this end, De Noble, Jung and Ehrlich's (1999) scale is used to measure the Entrepreneurial Self-Efficacy of G20 YEA and IFYE leaders, given that the authors have developed in the field of Self-Efficacy a set of skills that resemble the actual demands and needs of entrepreneurs, which identifies individuals who may be more likely to be self-employed when they believe they have the skills required to lead their own businesses successfully (Simões, 2016).

With regard to Cognitive Flexibility, Dennis and Vander Wal's instrument (2010) is used as it is a brief self-report measure of the type of CF needed for individuals to successfully challenge and replace rigid thoughts with more balanced and adaptive thoughts (Dennis and Vander Wal, 2010).

The present research seeks to answer the following guiding question: What is the relationship between Cognitive Flexibility and Entrepreneurial Self-Efficacy of G20 YEA and IFYE leaders?

For that, it was defined as a general objective to evaluate the relationship between Cognitive Flexibility, with its subscales, and Entrepreneurial Self-efficacy, with its dimensions, of leaders representing young entrepreneurs in the G20 YEA and IFYE, considering that the way entrepreneurs think and act has become an indispensable issue to support entrepreneurial activities carried out independently or within organizations, as well as in the genesis of new businesses (Hisrich, et al., 2007).

It is also noteworthy that the study of Cognitive Flexibility is relevant to the understanding of the subjects' ability to receive knowledge (problem situation), represent it, (re)structure it and, in view of this, develop a repertoire of responses to extract the most effective one (Guerra, 2012). Aligning also to the importance of Entrepreneurial Self-efficacy study that demonstrates a person's belief in their sufficient abilities to undertake (Miao, Qian e Ma, 2017).

Furthermore, the present study is justified for two reasons: although the positive relationship between Cognitive Flexibility and general Self-efficacy has been demonstrated in previous studies dating back approximately 37 years, in the bibliographic databases PsycNET, EBSCO, Dialnet, CAPES, and Google Scholar one can find only the article by Dheer e Lenartowicz (2017) relating Cognitive Flexibility and Entrepreneurial Self-efficacy; second, it should be noted that the characteristics of the respondents are also little seen in academic works, because, the leaders of the G20 YEA and IFYE are people of difficult access, as they are from different countries and the meetings of the groups also take place in different regions of the world.

The article is structured in five sections, beginning with this introduction; in section two the theoretical foundation is presented; followed by the methodological procedures in the third section. The results are presented in section four and in section five the final considerations of the research are made and, finally, the bibliographical references cited are made available.

## THEORETICAL FRAMEWORK

This section begins by contextualizing the constructs studied: cognitive flexibility and entrepreneurial self-efficacy. At the end, the hypotheses of the study are presented.

### Cognitive flexibility

In many routine situations, whether in personal, professional and/or family environments, there are problems to be solved that demand different and innovative answers, considering that, as time goes by, an automated and unsuitable behavior no longer generates resolving effectiveness.

As for the business environment, which is inserted in a global environment of interactions between diverse and adverse realities, that is, of economic uncertainties (Prigogine and Stengers, 1997; Morin, et al., 2002), opportunities usually appear overshadowed by situations of risk and instability, stimulating entrepreneurs to take strategic and innovative decisions, which, when the right ones, promote adaptation to the market dynamism.

It happens that performing the subtleties of adaptation to new and/or difficult situations is an arduous task, and is considered a human difficulty that stems from processes of cognitive inflexibility (French and Sternberg, 1989), which are often related to cognitive blocking, defined by the maintenance of an action that is no longer effective for the problem-situation, or to functional fixation, characterized by a fixation on a particular function of an object or element that the person is using to solve a problem (Duncker, 1945).

Cognitive inflexibility is a human error understood as the inability of the subject to reject the automated process to then enter a controlled processing that can transfer knowledge and compose a new range of behaviors, managing their responses to environmental stimuli (Guerra, et al., 2014). Cognitive rigidity and automatization interfere with the constitution of the framework of effective responses to resolve a certain new and/or difficult situation that presents itself to the subject, giving opportunity to resolute ineffectiveness and, consequently, to inconvenient discontent and frustration (Dennis and Vander Wal, 2010).

Depending on the problem-situation to be solved, the subject unable to detect it as needing a different behavior generates a drop in his performance below the expected level, which can, for example, influence his business life, his academic results, his personal interactions, and so many other complex and unstructured domains that demand cognitive acumen (Spiro et al., 1987).

The studies on Cognitive Flexibility began in the 1950s related to the creative behavior of human beings, considering that the execution of an innovative attitude to a problem-situation stems from creativity (Guerra, et al., 2014). For Moradzadeh and Pirkhaefi (2018), the individual with cognitive flexibility is able to store and organize information in different ways, which translates into the way he thinks and, consequently, how he acts. Faced with new situations, he is able to restructure knowledge and be more effective in responding Martínez and Perez (2019), in turn, understand it as an executive function of the brain and highlight its role in solving complex problems Vignochi, et al., (2020) clarify that CF enables people to generate alternative responses to opportunities and avoid courses of action that restrict adaptation to new and/or difficult problem situations.

Frick et al., (1959) identified in two types of flexible thinking the link between Cognitive Flexibility and creative behavior: (a) divergent thinking, which focuses on diffuse attention as a generator of original ideas; and (b) associative fluency, which links distant knowledge amenable to resolvable application in real-life problem-situations (Guerra, et al., 2014).

In this study, we chose to use the theoretical and practical line of Dennis and Vander Wal (2010) who understand Cognitive Flexibility as the ability to change cognitive sets to adapt to changes in environmental stimuli, being measured by the Cognitive Flexibility Inventory (CFI). The CFI was created as a brief self-report measure with multiple subscales so that it would reliably and validly measure distinct aspects of CF, which could have distinct relationships with other psychological constructs such as depression and suicidal ideation (Dennis and Vander Wal, 2010).

For these reasons, the CFI proved to be effective for the present study, according to the three relevant points pointed out: (a) objectivity and brevity to measure levels of Cognitive Flexibility; (b) developed based on a longitudinal study, where potential differences in coping strategies used by cognitively flexible versus inflexible people, in response to life event stress, were investigated; (c) used in studies promoted in several countries (Barrett-Pink, 2018; Bullard, et al., 2019; Johnson, 2016; Yu, et al., 2019; Muyan-Yilik e Demir, 2019; Oshiro, et al., 2016; Roshani et al., 2019; Sung, et al., 2019).

The CFI measures three aspects of Cognitive Flexibility: (a) the tendency to perceive difficult situations as controllable; (b) the ability to perceive multiple alternative explanations for life occurrences and human behavior; (c) the ability to generate multiple alternative solutions to difficult situations (Dennis and Vander Wal, 2010). The Control subscale is composed of 7 items that aim to measure the "a" aspect focused on the perception of new and/or difficult situations as controllable (Dennis and Vander Wal, 2010).

On the other hand, the second factor, called the Alternatives subscale, is composed of 13 items that measure the "b and c" aspects focused on the perception of multiple alternative explanations for life occurrences and human behavior, as well as the ability to generate multiple alternative solutions to new and/or difficult situations (Dennis and Vander Wal, 2010).

### Entrepreneurial self-efficacy

Self-efficacy has its origin in the Social Cognitive Theory (SCT) developed by Bandura (1977) and that, through a set of investigations reported in several articles and books, represents the latest theoretical position of this author. Self-efficacy, in his conception, is the personal judgment regarding the activities run level required to deal with a given situation or, in other words, it is a personality trait that affects the motivation to successfully perform certain tasks or the degree of tolerance to face certain adverse situations, as well as the individual's perception of risk Bandura (1977).

As Bandura (1986) points out, it is one of the aspects of self-knowledge that perhaps has the greatest influence on people's daily lives, because it expresses the conceptions about our personal effectiveness, that is, it is characterized by the degree to which people believe in their abilities to perform a behavior and that it is possible to accomplish it with the skills they have.

Without people believing that they can produce desired effects by their actions, they will have little incentive to act or persevere in the face of difficulties. Whatever other factors serve as motivators, they are rooted in the core belief that one has the power to produce change through action (Bandura, 1999). Thus, people with a higher degree of belief in their abilities to solve a problem situation, that is, with higher Self-efficacy, are more likely to pursue and persist with a task than those who have it to a lesser extent Bandura (1977).

In order to measure self-efficacy more accurately and reliably, Bandura (1977; 1997) stated that the study of self-efficacy must be developed in a specific context in order to identify the domain of the task to be performed by individuals. Supported by this assertion, several researchers have aggregated a number of measures related to specific domains of Self-efficacy, rather than relying on a comprehensive test that measures only general Self-efficacy (McGee et al., 2009).

In this step, Entrepreneurial Self-efficacy emerged with a view toward aspects related to entrepreneurship, that is, toward the specific domain of creating a new business. A number of scholars have strived for a greater predictive power of this construct, thus concerned with studying Entrepreneurial Self-efficacy.

Studies on Entrepreneurial Self-efficacy (ESE) go back approximately 30 years, when Chen, et al., (1998) argued that Self-efficacy is the fundamental attribute that differentiates entrepreneurs from managers, that is, ESE is an individual's belief in his or her ability to perform entrepreneurial outcome-oriented tasks and functions, playing a crucial role in determining whether individuals pursue entrepreneurial careers and exercise entrepreneurial behavior.

De Noble, et al., (1999) understand Entrepreneurial Self-efficacy as a construct that measures a person's belief in her own abilities, to fulfill the various requirements in pursuing a new entrepreneurial opportunity, as an explanatory bridge to an entrepreneur's initial effort to create and develop a new business.

For Miao, et al., (2017), Entrepreneurial Self-efficacy has emerged as a key psychological construct in entrepreneurship research, and its influence on entrepreneurship motivation, intention, behavior, and performance has been discovered.

Self-report measures have been widely used to measure the entrepreneurial self-efficacy of different people in specific domains and different contexts, including college students, entrepreneurs, and franchisees. Among the 6 most widely used measurement forms, the one by De Noble, et al., (1999), chosen for this study, stands out, which has been used in empirical studies in the national context in order to validate the scale for the Brazilian scenario, as an example the research conducted by Lizote e Verdinelli (2015); Lizote, et al., (2013); Silva Filho and Lizote (2019) and also in the international scenario it was applied in several studies (Sanchez and Hernández-Sánchez, 2013; Welsh, et al., 2016).

The Entrepreneurial Self-Efficacy (ESE) scale is composed of 23 items grouped into 6 dimensions, namely: defining the main objective of the business; building an innovative environment; developing new products and market opportunities; starting relationships with investors; dealing with unexpected changes; developing key human resources for the company.

Based on the theoretical review presented, the relationship between CF and SE is expected to confirm previous studies on the relationship between Cognitive Flexibility and General Self-efficacy beliefs, where significant positive mutuality relationships were obtained between the constructs (Brewster, 2011; Çelikkaleli, 2014; Kim e Omizo, 2005; and Shimogori, 2013). Recall that only the article by Dheer and Lenartowicz (2017) relating Cognitive Flexibility and Entrepreneurial Self-efficacy was found.

Given this, the respective hypotheses are presented.

- H1: The Cognitive Flexibility Control Subscale (CFCSS) relates positively and significantly to Entrepreneurial Self-efficacy.
- H2: The Alternatives Subscale of Cognitive Flexibility (ASSCF) relates positively and significantly to Entrepreneurial Self-efficacy.
- H3: Cognitive Flexibility relates positively and significantly to Entrepreneurial Self-efficacy.
- H4: Cognitive Flexibility is positively and significantly related to the "Coping with Unexpected Change" Dimension of Entrepreneurial Self-efficacy (UCESE).

## METHODOLOGICAL PROCEDURE

This research is characterized giving its nature as descriptive and correlational, according to the classification of Hernández, et al., (2006). As for its approach, it is classified as qualitative and quantitative. The population of this study consisted of the 20 leaders of young entrepreneurs who are members of the G20 YEA and 17 leaders who are members of the IFYE, for a total of 37 leaders.

Even knowing that the number of leaders would not reach 40, which would naturally incline the research to a mixed methodological approach, only the quantitative approach was used, through data collection by questionnaires. This choice of capturing primary data was made due to the 15-minute deadline given by the Presidents in the agendas of the G20 YEA and IFYE meetings.

At the G20 YEA Assembly held in the city of Balneário Camboriú/SC on November 23rd and 24th, 2017, the business associations of 10 countries and the European Union were present, at which time the absence of the other countries was justified due to the upcoming 2018 G20 YEA Summit in Buenos Aires/Argentina. Thus, in a pre-scheduled moment with the mediator of the Assembly, two questionnaires were distributed to all the leaders present, one referring to the Cognitive Flexibility construct and the other referring to Entrepreneurial Self-Efficacy. Thus, the sample was constituted with the following national representations: Futurpreneur (Canada); Future

Academy (China); JCI (Japan); European Confederation of Young Entrepreneurs (European Union); Entrepreneurs' Organization (Indonesia); Citizen Entrepreneurs (France); Wirtschaftsunioren Deutschland aka JCI Germany (Germany); Young Indians (India) and The Confindustria Young Entrepreneurs Movement (Italy); Came Joven (Argentina); National Confederation of Young Entrepreneurs (Brazil).

As for the 8th IFYE Congress, business associations from 11 countries were present, and the absence of the others was justified for two reasons: first, the Congress was to be held in Mexico, but due to the earthquake that hit the country, it was transferred to Brazil; second, the agenda was specific to the election of the new board of directors of the collegiate body. Under these circumstances, the President of the IFYE opened space in the main meeting of the Congress, where the two questionnaires were applied. Thus, the sample consisted of the following national representations: Confederación Española Jóvenes Empresarios (Spain); Associação Nacional de Jovens Empresarios (Portugal); Confederação Nacional de Jovens Empresarios (Brazil); Asociación de Jóvenes Empresarios (Uruguay); Asociación Nacional de Jóvenes Empresarios (Dominican Republic); Juventud Empresa (Bolivia); Asociación de Jóvenes Empresarios (Costa Rica); Asociación de Jóvenes Empresarios (Ecuador); Asociación de Jóvenes Empresarios (Paraguay); Asociación de Jóvenes Empresarios (Peru); Asociación de Jóvenes Empresarios (Chile).

The research instrument was translated into three languages (English, Spanish and Portuguese) and was organized into three blocks. The first block, referring to Cognitive Flexibility, used the Dennis and Vander Wal model, 2010 already validated. It is a scale with 20 statements divided into an alternative's subscale and a control subscale. Item responses were recorded on a seven-point scale, where the first point (1) meant strongly disagree, and the seventh point (7) meant strongly agree. The second block was composed of 23 items, as proposed by De Noble, et al., (1999) to measure entrepreneurial self-efficacy. A 7-point Likert-type scale was also used, ranging from strongly disagree (1) to strongly agree (7). The values assigned were based on six subscales: developing new products and market opportunities; building an innovative environment; starting relationships with investors; defining the main goal of the business; overcoming unexpected changes; and developing key human resources for the company. Finally, in the last block, we sought to know the respondents' sociodemographic profile.

With the research constructs established, the variables that reflect them were defined and, especially, operationalize their measurement, which are contained in the measurement models applied to the respondents. According to Hair, et al., (2009), to perform the measurement it is necessary that the variables are

empirically observable and capable of being measured, that is, they must be defined as measurable items.

It is noteworthy that, at a stage prior to the application of the instruments, important decisions were made for the development of the research. For every measurement instrument, it is essential to demonstrate its reliability and validity, which are guaranteed through certain statistical techniques, as pointed out by Hair, et al., (2009) In this case, given the small number of respondents in the sample ( $n = 22$ ), as well as the broad internal consistency and validation of the instruments used in this study, the confirmatory factor analysis was dispensed. Reis (1997) and Hair, et al. (2009) suggest that to conduct the factor analysis the number of observations should be at least 5 times the number of variables, and that it should preferably be done with at least 100 observations. Hair, et al. (2009) emphasizes that it should not be used in samples smaller than 50 observations.

For this reason, reliable measurement models that have already been tested by international researchers in different countries were chosen, since the respondents in the present study are from 21 nations represented in the G20 YEA and IFYE.

The data collected in the survey were organized in an Excel® spreadsheet to perform the pre-treatment following the recommendations in Hair, et al. (2009). Initially, the existence of missing data and typing errors was analyzed. The number of missing data did not exceed 10% in either a respondent or a variable, so its value was filled in by the median of the variable under consideration. The leaders representing the business associations from India and Peru failed to answer one of the 43 statements, being the seventh statement of the Entrepreneurial Self-Efficacy questionnaire and the second statement of the Cognitive Flexibility questionnaire, respectively, where they were filled in with the medians of the items. In addition to the data pertinent to the Likert scales, the respondents' sociodemographic data were tabulated.

Thus, the spreadsheet with the scores resulting from the addition of the Likert scale items, referring to the levels of the CF and ESE constructs, as well as their dimensions, was imported into the Tosmana®, RStudio® and SPSS® software.

Primarily, fuzzy set qualitative comparative analysis (fsQCA), the primary analytical approach of this study, was performed in view of the small number of cases, in order to preserve the complexity of the observations and the theoretical implications of the findings (Ragin, 1987). In this way, fsQCA serves to address the difficulty of fitting numbers into qualitative studies. To this end, the analysis was performed using Tosmana® (Tool for Small-N Analysis) software, which employs in its algorithms the Theory of Sets and Boolean algebra that seek to evaluate the combinations of conditions or factors that are present or absent when a phenomenon of interest occurs or does not occur. However, the results arising from QCA do not determine causal relationships, but rather indicate them through patterns of associations between sets in terms of sufficiency and necessity, thus providing support for the existence of causality (Schneider, and Wagemann, 2010).

Both RStudio® and SPSS® were the software through which the relevant statistical techniques were applied to corroborate and complement the QCA results (Schneider, and Wagemann, 2010) which, obviously, are restricted to the sample of this research. Thus, basic descriptive statistics were applied to calculate the descriptors of each construct, including the average, median, mode, asymmetry and kurtosis. As Hair, et al., (2009) point out, it is through the asymmetry and kurtosis that the normality of the data can be evaluated. According to Finney and DiStefano (2006), with values in the range  $[-2; 2]$  and  $[-7; 7]$ , respectively for those descriptors, the variable distribution should be considered as quasi-normal. Furthermore, normality is assumed by Histogram plots, Quantile-Quantile (Q-Q Plot) and

Quantile-Quantile with envelope (QQ Plot envelope) diagrams, ultimately confirming it in statistical tests of normality (Chantarangsi et al., 2015).

Following the descriptive data analysis step, bivariate and multivariate statistical techniques were used on the constructs. With the purified data, the relationships between Cognitive Flexibility and Entrepreneurial Self-efficacy were evaluated through the calculation of the correlation by Pearson's coefficient, considering the possible normality of the data Dancey and Reidy (2005). point to the following classification that will be used in this study:  $r = 0.10$  to  $0.30$  (weak);  $r = 0.40$  to  $0.60$  (moderate);  $r = 0.70$  to  $1$  (strong).

Finally, linear regression analysis was applied, aiming to corroborate a possible causal relationship between the constructs verified in the QCA, always considering the theoretical framework that underlies the present study (Barbetta, 1994).

## RESULTS AND ANALYSIS

The profile of the leaders consists of a majority of men in both groups at a percentage of 86% of the respondents (19), while female leadership corresponds to 14% of the total participants (3), being from the following nationalities and respective groups: Italy/G20 YEA and Dominican Republic and Brazil/ IFYE. The average age in both groups corresponds to young adults (35-40 years old). In addition, it is important to highlight the data on the difficulties in the management of the respondents' companies, of which the financial obstacle (27%) and people management (45%) stood out.

### Results from fuzzy sets comparative qualitative analysis (fsQCA)

This subsection presents the fsQCA results from the Tosmana® software that uses Theory of Set and Boolean algebra to create the Truth Table (Table 1), the main tool for comparative qualitative analysis of the data (Schneider and Wagemann, 2010).

With this method, hypotheses H1 and H2 will be addressed, considering that it is indispensable to have at least two causal conditions or two factors (ASSCF and CFCSS) for one outcome (ESE).

To reach this result, the qualitative anchors were calibrated, with three scores of belonging (0, 0.6 and 1) that relate to constructs level (low, moderate and high) established by the

**Table 1**

Research truth table

Countries	Tosmana Report Truth table			
	ASSCF	CFCSS	ESE	Consistency
Italy, Indonesia, Bolivia, Spain	0	0	0	0,3824
EU, France, Japan, India, Ecuador	0	1	0	0,2222
Argentina, Peru, Paraguay, Costa Rica	1	0	1	1,0000
Canada, China, Germany, Brazil, Uruguay, Dominican Republic, Chile, Portugal	1	1	1	0,9394
Result: ESE				
# Implications				
# Results:	Consistency	Coverage	Cob. Single	-
FCA	0,9623	0,9107	-	-
FCA	0,9623	0,9107	**	-

Note: Minimization (ESE); Inclusion (R); Consistency limit (0,9); Frequency limit (4). Tosmana (2020).

percentiles of the scales (0%, 33%, 66% and 100%) fixing two limits between the lowest and the highest value of the score generated by the individuals of the sample, that is, the low CF Alternatives and Control subscales are characterized when the scores are between the values 56 and 69, and 21 and 32 (0), respectively. Moderate is perceived when scores are between the values 70 and 74, and 33 and 41 (0.6), respectively. And finally, high is verified when scores are between the values 75 and 91, and 34 and 48 (1), respectively for each CF subscale. In turn, ESE is low or absent when each individual's scores are between 85 and 119 (0), moderate when they are between 120 and 132 (0.6), and high when they are between 132 and 161 (1), with moderate and high ES being characteristics of the presence of the outcome.

In the program configuration the presence of the construct Entrepreneurial Self-Efficacy (ESE) was inserted as a result of the Boolean minimization, which reduces the primitive expressions (combinations of causal conditions or individual causal condition) into logical simplifications when identifying the repeated combinations or individual condition sufficient to generate the result (ESE).

The inclusion of logical remainders was also configured, which did not occur in this research because all cases participate in some combination of conditions. Next, a value of 0.9 was assigned for the consistency limit of the combinations of causal conditions, that is, for all configured logical possibilities their consistency in generating the ESE result is calculated. The established threshold is higher than the suggested threshold used in research of  $>0.8$  (Ragin, 2000; 2006) and is found in the rows of the Truth Table next to the case sets (countries).

Consistency and coverage of conditions or combinations thereof are outcome measures of fit. With respect to consistency, this measure assesses the degree to which cases associated with a condition or combination of conditions satisfy the sufficiency or necessity property, e.g., when more than 80% ( $>0.8$ ) of cases have belongingness scores for the condition or combination equal to or less than the belongingness scores in the outcome, the condition or combination can be said to be sufficient for the outcome (Ragin, 2000; 2006).

Each set of cases is linked to a combination of causal conditions that may or may not be significant for the occurrence of the outcome (Thiem, 2010). As mentioned, for a combination of conditions to be a subset of the outcome ESE, that is, for it to be significant to the succession of the outcome, it must be  $>0.9$  (greater than the consistency limit).

The last two rows show consistency values greater than the threshold of 0.9, therefore, with significant combinations of causal conditions for the occurrence of ESE. The second to last row shows the set of cases composed of the leaders of young entrepreneurs from Argentina, Peru, Paraguay and Costa Rica, which have moderate and high scores on the Alternatives Subscale of Cognitive Flexibility (ASSCF) and low scores on the Control subscale (CFCSS), with these conditions coded by means of Boolean algebra as  $ASSCF = 1$  and  $CFCSS = 0$ . Thus, it is denoted that the presence of the ASSCF and the absence of the CFCSS result in the presence of ESE, considering also that all cases in the set of the combination of the two conditions are sufficient for such a result, a situation that generated the maximum consistency of 1.

Despite the full consistency of the combination of conditions ( $ASSCF \sim CFCSS$ ), its coverage value is 0.43, demonstrating that less than half of the cases that are present in the ESE result are covered by said logical combination, it is worth saying that the combination of conditions explains 43% of the result, in analogy to the coefficient of determination (Thiem and Dusa, 2012).

In turn, the last row of the Truth Table contemplates a set of cases with nine leaders representing the following nations:

Canada, China, Germany, Brazil, Uruguay, Dominican Republic, Chile and Portugal; which is associated with the combination of the  $ASSCF * CFCSS$  conditions, obtaining high consistency (0.9394) sufficient for the presence of the ESE result. In other words, the presence of the Alternatives and Control subscales results in the presence of Entrepreneurial Self-efficacy. Similarly to the previous combination of conditions, the presence of the ASSCF and the presence of the CFCSS covers part of the ESE outcome, that is, of all cases sufficient for the ESE outcome only 55% of them are covered by this combination of conditions, being a percentage value slightly higher than the combination of presence of the ASSCF and absence of the CFCSS.

In short, two consistently sufficient combinations of conditions generate the result ESE ( $ASSCF \sim CFCSS + ASSCF * CFCSS$ ), however, they are not part of the final solution (prime implicants) of the Truth Table, because, Boolean minimization simplifies the primitive structures of conjunctions (fundamental intersections) into simpler solutions. The Boolean minimization rule thus states that if two fundamental intersections (combination of causal conditions) for the same outcome differ in the valence of a single condition, then this condition can be eliminated in order to result in a simpler term (Thiem and Dusa, 2012). Thus, the presence of the Alternatives Subscale of Cognitive Flexibility (ASSCF) was left as the only sufficient causal condition for the occurrence of the ESE outcome.

### Correlation and Linear Regression Results

According to Schneider and Wagemann (2010), the QCA must be applied in conjunction with other data analysis techniques, for this reason, to complement the results obtained in the comparative qualitative analysis were used the conventional statistical techniques of Correlation and Linear Regression, in view of the confirmation of normality in the distribution of the data that comprise the variables by Histogram, Quantile-Quantile Diagrams (Q-Q Plot) and Quantile-Quantile with envelope (Q-Q Plot envelope), confirming it, ultimately, in the statistical tests of normality (Chantarangsi et al., 2015; Leotti, et al., 2005; Norman and Streiner, 2014; Torman, et al., 2014). Moreover, for hypotheses H2 and H3, only such techniques were applied, as it was a matter of correlating only one independent variable with another dependent variable. Thus, Pearson's linear correlation coefficients were calculated.

The results show strong positive correlation between ASSCF and ESE ( $r = 0.74$ ), weak positive correlation between CFCSS and ESE ( $r = 0.28$ ), moderate positive correlation between CF and ESE ( $r = 0.65$ ) and moderate positive correlation between CF and UCESE ( $r = 0.61$ ), according to Dancey and Reidy (2005). We then applied Pearson's correlation test to verify the significance or not of the results for both correlations. With regard to the correlations between CFCSS and ESE, CF and ESE, and CF and UCESE, Pearson's correlation tests were significant ( $p = 0.000$ ); on the other hand, the test for CFCSS and ESE was not significant ( $p = 0.213$ ), making it clear that one variable does not influence the other and vice-versa.

At a later stage, it is sought a mathematical model that supports a possible prediction of the dependent variable (ESE) by the independent variables (ASSCF and CFCSS), so that it is possible to estimate the variability of ESE values (Hair, et al., 2009). From now on, it should be noted that the results obtained in the correlations show that the CFCSS has a weak positive correlation and not significant with the ESE, thus determining its removal from the linear regression model.

Thus, the regression model with the removal of the CFCSS resulted in a moderate coefficient of determination ( $r^2 = 0.54$ ). It is worth saying that only the independent variable ASSCF is

able to estimate 54% of the variability of ESE, regardless of the presence or absence of CFCSS in the model.

Finally, regression was applied for the moderate correlations between CF and ESE and CF and UCESE, which resulted in coefficients of determination  $r^2 = 0.65$  and  $r^2 = 0.61$  with significant Pearson's correlation tests ( $p = 0.001$  and  $p = 0.003$ ), respectively.

### Analysis of the results

The significant relationship between the variables is conjectured in all four hypotheses, since statistics yield positive and/or negative correlations in many instances insignificant to the outcome.

The first hypothesis (H1: The Control Subscale of Cognitive Flexibility is positively and significantly related to Entrepreneurial Self-efficacy) was entirely contradicted by the results, even though the causal condition or independent variable (CFCSS) is part of the data collection instrument (DCI) used in this research. Therefore, we must reflect theoretically on these results, since we expected the confirmation of the first hypothesis (H1).

The CFCSS is composed of 7 items of the Cognitive Flexibility Inventory (CFI) that aim to measure the aspect related to the "perception of new and/or difficult situations as manageable", i.e., that successful resolutions to difficult life situations are possible (Dennis and Vander Wal, 2010). In close analysis of the theory, it is glimpsed that this psychic attribute is not mentioned in most studies on Cognitive Flexibility (Cools et al., 2001; Frick et al., 1959; Kloo et al., 2010; Rocha, et al., 2017; Phillips, 1997; Phillips et al., 2002; Ravizza e Carter, 2008; Rogers et al., 1999; Sacharin, 2009), which highlight the aptitude in creating, generating, or producing a repertoire of alternative ideas for a problem-situation, gauged in the CFI by the items contained in the Alternatives Sub-scale (ASSCF).

In this way, it can be seen theoretically and inferred from the results, that in any situation, whether new and/or difficult, the main aspect of Cognitive Flexibility is the generation of a set of answers that enables the choice of the most effective one to solve the problem-situation, and not its perception as controllable, even more so considering that the respondents of the present research are young entrepreneurs involved in a hostile and fluid market environment, for which, although it seems uncontrollable, the entrepreneurial action is nevertheless carried out.

Following the same line of reasoning, entrepreneurship, by essence, is an area identified by uncertainty and the need to create multiple mental models and behaviors (Lizote et al., 2018), is associated with the tendency to consider multiple perspectives of an idea and devise multiple solutions to a problem (Roberts et al., 2017).

As such, the CFI captures the characteristics of perception and diversified production of solutions so relevant to the act of entrepreneurship through 13 items (ASSCF) that specifically seek to obtain the respondents' ability to "perceive multiple alternative explanations for life occurrences and human behavior" as well as to "generate multiple alternative solutions to difficult situations" (Dennis and Vander Wal, 2010, p.242). It is through the Alternatives Subscale of Cognitive Flexibility (ASSCF) is manifested in the present study, fulfilling an important role in the relationship with Entrepreneurial Self-efficacy (ESE). Therefore, the second hypothesis (H2: The Alternatives subscale of Cognitive Flexibility relates positively and significantly to Entrepreneurial Self-efficacy) was confirmed by the results obtained, thus suggesting that moderate and high levels of Cognitive Flexibility are important antecedents of Entrepreneurial Self-efficacy, given that Cognitive Flexibility

is associated with greater creativity, innovation, and generative thinking (Barbey, et al., 2013; Ritter et al., 2012), allowing individuals to perceive more confidence in their abilities to create new businesses, that is, individuals with Cognitive Flexibility are more confident to engage in entrepreneurial activities.

The hypotheses (H3: Cognitive Flexibility relates positively and significantly to Entrepreneurial Self-efficacy and H4: Cognitive Flexibility relates positively and significantly to the "Coping with Unexpected Change" Dimension of Entrepreneurial Self-efficacy) were confirmed by the results and correspond to the theoretical foundations of the research, in that, regarding H3, if ASSCF has a strong positive correlation with ESE, it was expected that CF would have a positive correlation, but with less intensity due to the presence of the CFCSS items, which was rejected by the results.

At the same pace, for H4 the same result was expected, since the dimension of ESE that is closest to the theoretical foundations refers to knowing how to "deal with unexpected changes", that is, Cognitive Flexibility generates multiple solutions in the face of difficult situations arising from entrepreneurial activity which, in turn, has a strong characteristic in the uncertainty of the market that produces unexpected changes.

### CONCLUSIONS

The present research aimed to evaluate the relationship between Cognitive Flexibility and Entrepreneurial Self-Efficacy of leaders representing young entrepreneurs in the G20 YEA and IFYE, in order to confirm or reject the proposed theoretical model. These leaders are also entrepreneurs, men and women who live with the mishaps and turbulences of the market and, for these reasons, carry the experience of the entrepreneurial life. All of them have personality traits relevant to entrepreneurship that can be measured by suitable research instruments.

According to the results, these leaders did not manifest a tendency to perceive difficult situations arising from entrepreneurial activity as controllable, given the numerous variables that make the business environment so volatile and fickle (H1: The Control subscale of Cognitive Flexibility relates positively and significantly to Entrepreneurial Self-efficacy), however, they maintain dexterity in perceiving and generating multiple explanations and alternative solutions to such uncertain, difficult, and/or new occurrences (H2: Alternatives subscale of Cognitive Flexibility relates positively and significantly to Entrepreneurial Self-efficacy; H3: Cognitive Flexibility relates positively and significantly to Entrepreneurial Self-efficacy), positively influencing the belief that their abilities are effective and sufficient to organize and carry out courses of action necessary to create a new business, develop an existing business, or solve problems arising from unexpected changes (H4: Cognitive Flexibility relates positively and significantly to the "Coping with Unexpected Change" Dimension of Entrepreneurial Self-efficacy).

In another vein, and beyond their entrepreneurial careers, these leaders represent their countries in the main regional and global deliberation groups, the IFYE and the G20 YEA, respectively. In these environments of discussion, debate, and decision-making, the leaders carry out important political work, exercising their skills that are able to influence the directions of youth entrepreneurship policies in Latin America and the World. For example, having Cognitive Flexibility when faced with a complex and/or new agenda item influences a leader to believe that his or her entrepreneurial skills are sufficient to direct his or her manifestations and deliberations in a meeting.

It is essential to emphasize that the conclusions drawn from the results are not statistical inferences, given that there were few observations ( $n = 22$ ) of inestimable significance, since

these are individuals who represent youth entrepreneurship in their countries and, therefore, in Latin America and the Iberian Peninsula (IFYE), as well as in the World (G20 YEA). Thus, there is no generalization of the results to the sample population, because the use of the configurational and conventional statistical techniques for few observations requires parsimony in the conclusions (Reis, 1997; 2009).

Cognitive Flexibility is an important skill for solving problems and/or new situations, therefore, its study in future research as an antecedent of cognitive skills related to entrepreneurship, such as Self-efficacy and Entrepreneurial Intention, is very important for understanding the characteristics, motivations, attitudes, and strategies that entrepreneurs share with each other, because the usefulness of this knowledge allows us to have tools in the entrepreneurial training of people active in the market or future entrepreneurs.

### Conflit of interest statement

*The authors hereby confirm that there are no competing interests to declare.*

### Authors' statement of individual contributions

Roles	Authors Contributions		
	Aguirre, D	Lizote, S	Guerra, MC
Conceptualization		■	■
Methodology	■		
Software	■		
Validation	■		
Formal analysis		■	■
Investigation	■	■	
Resources		N.A.	
Data Curation		N.A.	
Writing - Original Draft	■	■	■
Writing - Review e Editing		■	■
Visualization	■	■	■
Supervision	■		■
Project administration		■	
Funding acquisition		N.A.	

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