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## Explanatory factors of collective competencies in fashion design teams

*Fatores explicativos das competências coletivas em equipes de design de moda*

*Factores explicativos de las competencias colectivas en equipos de diseño de moda*

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### ABSTRACT

This article aims to identify the explanatory factors of collective competencies in fashion design teams using a survey of 22 fashion designers from Santa Catarina. Exploratory factor data analysis and analysis of variance techniques were applied. The results showed four explanatory factors: collective spirit, interaction, cooperation, and relationship. Our findings made evident how relevant these factors are in the composition and formation of groups, manifesting themselves as descriptive and essential attributes for collective competencies. The synergistic combination of the factors allows the teams to develop shared actions in favor of work organization based on interactions and visions, which, although distinct, can be shared.

**Keywords:** collective competencies; explanatory factors; teams; groups; fashion design.

### RESUMO

Este artigo possui como objetivo identificar os fatores explicativos das competências coletivas em equipes de design de moda. Utilizando-se de uma *survey* com 22 equipes de design de moda catarinenses, foram aplicadas as técnicas de análise de dados fatorial exploratória e análise de variância. Os resultados demonstraram quatro fatores explicativos presentes: espírito coletivo, interação, cooperação e relacionamento. Nossas descobertas deixaram evidente o quanto esses fatores são relevantes na composição e formação dos grupos, manifestando-se como atributos explicativos e essenciais para as competências coletivas. A combinação sinérgica dos fatores encontrados permite às equipes desenvolverem ações compartilhadas em prol da organização do trabalho, a partir das interações e visões, que mesmo distintas, podem ser compartilhadas.

**Palavras-chave:** competências coletivas; fatores explicativos; equipes; grupos; design de moda.

### RESUMEN

Este artículo tiene como objetivo identificar los factores explicativos de las competencias colectivas en los equipos de diseño de moda. Mediante una encuesta con 22 equipos de diseño de moda de Santa Catarina, se aplicaron técnicas de análisis exploratorio de datos de factores y análisis de varianza. Los resultados mostraron cuatro factores explicativos presentes: espíritu colectivo, interacción, cooperación y relación. Nuestros hallazgos evidenciaron cuán relevantes son estos factores en la composición y formación de grupos, manifestándose como atributos explicativos y esenciales para las competencias colectivas. La combinación sinérgica de los factores encontrados permite a los equipos desarrollar acciones compartidas a favor de la organización del trabajo, basadas en interacciones y visiones, que, aunque distintas, pueden ser compartidas.

**Palabras clave:** competencias colectivas; factores explicativos; equipos; grupos; diseño de moda.

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## 1 INTRODUCTION

The famous motto "one for all, all for one," known from the story of the three musketeers by French writer Alexandre Dumas, represents the union between people so that everyone achieves the desired goal. In the current context of organizations, it is possible to associate this representation with the collective competencies of work teams, considered by Toderò et al. (2016) as the ability of a set of individuals to collaborate towards a common goal, assuming a shared vision built by the quality of interactions between these individuals.

The ability to work in a team is considered the primary competence required for administrators in the job market (Martins-Silva et al., 2016). Collective competence has been highlighted in organizational discussions (Avelino et al., 2017; Guernoub & Kerkoub, 2019) as a new management tool that aims to improve the efficiency and functioning of teams (Guernoub & Kerkoub, 2019), making it possible to develop collective works (El Hammioui, 2020). Through the collective dimension of competencies, it is possible to develop a collective knowledge base that helps to improve collaboration, communication, and understanding among team members (Langlois, 2020), improving work performance and contributing to organizational results (Silva & Ghedine, 2020).

Given this reality, Korica and Bazin (2019) draw attention to the fact that the creative processes of fashion design teams demand collective work, corroborating some studies that point to the importance of collective competencies for fashion design teams (Libânio & Amaral, 2016, 2017; Silva & Ghedine, 2020). This article aims to identify the factors that explain collective competencies in fashion design teams to contribute to the development and formation of collective competencies.

This study is justified by the need to develop works that address the issue of collective competence (Avelino et al., 2017; Silva & Ghedine, 2019; Wagner et al., 2020; Fuel et al., 2021) in different organizational realities since there is a noticeable lack of empirical evidence to prove its dynamics (Wagner et al., 2020). Great attention is needed to assess and monitor their development (Macke & Crespi, 2016) and the need for quantitative work that measures them based on their constitutive elements, considering the strategic importance of collective competencies (Silva & Ghedine, 2020).

The present study was carried out with fashion design teams from companies from Santa Catarina since the state stands out nationally for the concentration of textile and clothing industries (Libânio & Amaral, 2016, 2017; Lins, 2018), constituting a particular scenario. Interest for studies on such issues (Lins, 2018). The clothing segment is representative of Santa Catarina, corresponding to 18.8% of industrial enterprises and 21.8% of industrial jobs (Sebrae, 2019). Given the lack of empirical evidence on the subject of collective competencies, this study presents some results and contributions: 1) it demonstrates the factors that explain the collective competencies of fashion

design teams; 2) the synergistic combination of the identified factors evidenced their relevance in the composition and formation of the groups; 3) two factors were divergent (collective spirit and interaction) and two convergent factors (cooperation and relationship) in the analyzed teams; 4) for the fashion industry, it contributed by demonstrating factors capable of forming or developing collective competences.

This article initially presents the theoretical framework, portraying the collective competencies and fashion design teams. Then, the methodological procedures used, the main results of this research are exposed and discussed, and finally, the final considerations.

## 2 THEORETICAL FRAMEWORK

This section presents the main theoretical contributions that supported this research.

### 2.1 Collective Competencies

The emergence of collective competencies is based on effective individual skill combinations and reciprocal interactions, where team members learn to act and think together to overcome their conflicts. The team must be designed as a dynamic system where its members' communications, interactions, and emotional relationships intersect (Guernoub & Kerkoub, 2019). Thus, collective competence is situated in a network of interactions between people (Langlois, 2020) through their relationships and collaboration processes, configuring a team's ability to carry out their work activities (Wagner et al., 2020).

Macke and Crespi (2016) found four factors that explain collective competencies in work teams: proactivity, communication, cooperation, and interpersonal relationships. For Zarafian (2001), competence is linked to the ability of people to assume responsibilities in complex work situations, act proactively, and face unpredictability. In this way, proactivity is one of the essential attitudes for developing collective competencies.

The content of collective competencies involves knowing how to communicate (Le Boterf, 2003). Communication facilitates the distribution and execution of tasks, enables creative and quick decision-making (Giansante et al., 2015), and is a channel where team members can distribute crucial information to other members (Marlow et al., 2018).

It is possible to recognize the existence of collective competencies through knowing how to cooperate (Le Boterf, 2003). To cooperate is to act together. It is to act and work together with several individuals (Zarafian, 2009). In order to have cooperation, it is necessary to tend towards a mutual understanding, to know the other in their intentions, expectations, desires, and beliefs (Felix et al., 2019). Cooperation is facilitated by developing a sense of interdependence and emotional engagement. It is constituted as an inducer of practical action because collective competence is expressed in doing together. The

collective sense is developed to meet common goals (Goldmeyer & Feuerschutte, 2017).

Collective competence generates results from relationships and mobilizes necessary resources and capabilities (Klein & Bitencourt, 2012). Friendly relationships can be understood as a determinant for meeting work requirements and needs (Lima & Silva, 2015). For Silva and Ruas (2014), relationships with greater involvement and identification of people with their colleagues and work bring them closer to collective competencies.

Although some works depict the characteristics or development of collective competencies (for example, Avelino et al., 2017; Lima & Silva, 2015; Silva & Ruas, 2016; Todero et al., 2016), few studies perform their identification. Among these few studies, Silva and Ruas (2016) stand out, who identified two collective competencies in a company in the financial sector. The first, called "relationship and collaboration," streamline the working relationship and engagement in the collaboration process to achieve common goals. The second, called "capacity to develop joint solutions," portrays the development of projects and programs in partnership with other company areas.

Graz et al. (2020) studied workers who worked in a hybrid production regime and identified three collective competencies: access, inclusion, and leverage. "Access" refers to collective action to pursue common interests and negotiate collective agreements. "Inclusion" addresses participation in establishing and reviewing labor standards, ensuring that all collective agreements are made available. "Leverage" is referred to as industrial and political pressure either to file a grievance or in pursuit of establishing specific outcomes.

Silva and Ghedine (2020), in research carried out in the fashion sector, identified six collective competencies in fashion design teams, namely, the ability to: cooperate, create, collection planning, decision making, problem-solving, approval of the collection, and achievement of goals. These collective competencies are configured in teams by the joint involvement of its members through interactions, collaboration, mutual support, and social exchanges to achieve shared goals.

The identification of collective competencies enables organizations to understand the collective activities of their teams. For this, they need to seek to develop their deficient collective competencies and form absent collective competencies necessary to improve the performance of their teams and contribute to the achievement of organizational results (Silva & Ghedine, 2020). Added to this, in the fashion industry, identifying collective competencies allows their articulation and development, collaborating in the integration and training of individuals and teams for design management (Libânio & Amaral, 2016).

## 2.2 Fashion Design Teams

A team represents a group of people in a typical situation whose tasks and results are interdependent, with

the articulation of actions and the interaction of professionals. A work team generates positive synergy through a coordinated effort, in which individual efforts result in a level of performance more incredible than the sum of individual contributions (Ciampone & Peduzzi, 2000; Puente-Palacios & Brito, 2017). Its members have specific and unique roles, where each person's performance contributes to collective success (Reis & Puente-Palacios, 2016; Zaccaro et al., 2001). This collective success derives from the team's competencies, which arise when its members share their knowledge, skills, and attitudes, which will result in the construction of a collective arrangement (Puente-Palacios & Brito, 2017).

In their routine product development activities and research of trends in the clothing industry, the fashion design teams require collective work practices. The product development process in fashion design teams is composed of steps requiring data, information, and skills that call for different individuals and teams (Libânio & Amaral, 2017). This highly collaborative process demands collective team decision-making (Payne, 2016).

Fashion design aims to design good clothes (Kim & Cho, 2000). Design collaboration is required with collective and joint efforts by sharing knowledge, ideas, resources, and responsibilities in product design. These design collaboration activities aim to improve product performance and organizational efficiency (Wang et al., 2017).

In this sense, Libânio and Amaral (2017) demonstrate that there are five phases and activities performed by fashion design professionals in the product development process in clothing companies: i) the collection concept includes elaborating guidelines and research trends and defining guidelines; ii) creation of the collection, through the grouping of different expertise of the team, the discussion and validation of the collection take place; iii) production of the pilot piece, the pilot pieces are produced, and production of the collection begins; iv) production of the collection, review, quality control, and distribution, the new collection concept is transmitted to the agents involved; v) market monitoring and data analysis take place. There are moments of creation, exchange, and retention of data and information in all phases and activities and the creation, development, and retention of individual, collective, and organizational skills.

Thus, it is observed that the clothing industry has many agents involved in its production systems. The dynamism of this market requires constant updates that require design management that takes a critical look at critical aspects related to processes, agents involved, information, and knowledge (Libânio & Amaral, 2017). Given the above, it is possible to affirm that collective competencies are highly relevant for fashion design teams. The work activities performed by these teams require constant collaboration between their members to jointly achieve their goal, that is, to develop products aligned with the purpose of the brand and organization.

### 3 METHODOLOGY

The present research is descriptive, with a quantitative approach and data collection through a survey. The target population considered were fashion design teams from Santa Catarina. The Santa Catarina fashion sector was selected for a few reasons. First, fashion design teams demand highly collective work. Several professionals are involved in creating a fashion collection whose collaborative activity becomes essential to achieving their shared goals (Mora, 2006). Second, Santa Catarina is considered the second-largest textile and apparel hub in the country, with 13.83% of companies having great representation in the social and economic context of the country (Sebrae, 2019). Third, studies are needed that delve into this globally remarkable sector (Korica & Bazin, 2019).

Data collection was carried out between February and March 2021 through an online Google Forms questionnaire sent by email and WhatsApp to team members. The questionnaire was prepared based on the instrument proposed by Crespi (2012) and Macke and Crespi (2016), with 19 items to measure the collective competencies of work teams. These items were measured on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The research obtained a sample of 22 fashion design teams composed of 4 to 12 members,

totaling 112 respondents. The sample was selected by convenience, in which the researchers select the participants to whom they have access, assuming that they can represent the research universe (Prodanov & Freitas, 2013).

In the data analysis procedure, two techniques were applied: exploratory factor analysis (EFA) and analysis of variance (ANOVA). Exploratory factor analysis is used when little is known about the possible relationships between the factors involved. This technique makes it possible to explore the data and provide the number of factors necessary to represent them better. Analysis of variance is a statistical technique used to compare differences between independent groups (Hair et al., 2009).

Initially, it was necessary to process the data through the Microsoft Excel software, and later, these data were imported and processed in the STATA/SE 13.0 software. In order to group collective competencies into factors, the EFA was used, with the varimax orthogonal factor rotation method, pointed out by Hair et al. (2009), as one of the most used. After EFA, the 19 variables were grouped into four factors (collective spirit, interaction, cooperation, and relationship), considering theoretical elements from other research (Table 1) on mobilizing collective competencies factors.

**Table 1**

Base Factors Reference

Factors	Base references
Collective Spirit	Bitencourt, Azevedo & Froehlich (2013); Klein & Bitencourt (2012); Silva & Ghedine (2020); Silva et al. (2014).
Interaction	Frohm (2002); Hansson (2003); Klein & Bitencourt (2012); Le Bofert (2003); Lima & Silva (2015); Sandberg & Tagarma (2007); Silva & Ghedine (2020).
Cooperation	Dupuich (2011); Felix, Araújo & Máximo (2019); Le Bofert (2003); Macke & Crespi (2016); Silva & Ghedine (2020).
Relationship	Macke & Crespi (2016); Puente-Palacios & Borba (2009); Silva & Ruas (2014); Silva & Ruas (2016); Silva, Uemura, Saboia, Pinheiro & Ghedine (2021).

Source: Elaborated by the authors.

Cronbach's alpha coefficient was calculated to measure the instrument's reliability, which resulted in a value of 0.9069, higher than the value indicated by Hair et al. (2009) (< 0.60). Cronbach's Alpha coefficient was also calculated for each factor to measure the internal consistency of the factors. Afterward, an analysis of variance (ANOVA) was performed, in addition to Tukey's Post Hoc test. Tukey's Post Hoc test, according to Hair et al. (2009), seeks to identify significant differences when performing comparisons between groups. In this case, the test sought to point out differences between the researched fashion design teams in terms of collective competence factors.

### 4 ANALYSIS AND DISCUSSION OF RESULTS

The analysis of the profile of fashion design professionals considered belt variables: sex, age, education, position, and length of service. The participants' profile (Table 2) is composed of females (80%) between 21 to 30 (52%), undergraduate education (56%), working as a stylist (35%), with 1 to 5 years of experience.

**Table 2**

Participants profile

Gender	Quantity	%
Male	22	20
Female	90	80
Age	Quantity	%
Up to 20	02	02
21 to 30	58	52
31 to 40	44	39
41 to 50	08	07
Education Level	Quantity	%
High School	09	08
Higher Education	63	56
Postgraduate Degree	40	36
Position	Quantity	%
Style assistant	18	16
Coordinator/Manager	22	20
Designer	16	14
Stylist	39	35
Fashion Designer	04	03
Others	13	12
Service time	Quantity	%
Up to 1 year	14	12
1 to 5 years	58	52
6 to 10 years	28	25
11 to 15 years	09	08
Over age 20	03	03

Source: Elaborated by the authors.

Corroborating the profile presented (Table 2), the research by Makara et al. (2017) carried out in the fashion area, specifically in the clothing industry, also highlights the predominance of some similar characteristics, such as female gender, approximate age, stylist position and approximate working time.

Regarding data analysis, initially, the EFA was performed with the 19 variables that resulted in four factors, with a Kaiser - Meyer - Olkin (KMO) index of adequacy of 0.8497. The indicated factors and each variable's factor loadings, means, and standard deviations are presented below (Table 3).

**Table 3**  
Collective Competencies Factors and Variables

Factors	Variables	Load Factor	Average	Deviation
Collective Spirit *0.8895	Q3: My colleagues have ways to show they care about each other.	0.6763	4.419	0.766
	Q4: In our team we recognize the efforts of colleagues.	0.6906	4.428	0.625
	Q8: When a problem hinders our progress, team members show motivation to solve it.	0.5730	4.330	0.787
	Q11: In our team colleagues usually share their knowledge.	0.5932	4.553	0.745
	Q12: My colleagues understand my strengths and weaknesses.	0.5368	4.116	0.867
	Q15: When I have problems, my teammates usually help me.	0.7795	4.464	0.746
	Q16: In our team, people are interested in learning more about their colleagues.	0.8440	4.125	0.959
	Q17: My colleagues encourage me to meet or exceed my personal and professional goals.	0.8001	4.142	1.021
Interaction *0.7809	Q18: In our team, there is a balanced distribution of tasks among members.	0.4080	3.732	1.090
	Q2: We pay attention to the moods in our team.	0.7576	4.392	0.727
	Q5: We recognize a tense situation and talk about it with team members.	0.7868	4.196	0.888
	Q6: We often discuss how to deal with everyday difficulties.	0.6260	3.883	1.046
Cooperation *0.5899	Q13: When I have a complaint I feel free to talk to a colleague(s) about it.	0.7230	3.875	1.005
	Q10: My colleagues often cooperate so that the team can achieve their goals.	0.6904	4.651	0.610
	Q14: My colleagues participate in team decision making with their suggestions.	0.7271	4.410	0.741
Relationship *0.5252	Q19: Our team tries to have good relationships with other teams.	0.5234	4.473	0.696
	Q1: Relationships in our team are based on cooperation.	0.6756	4.794	0.405
	Q7: Our team often find creative ways to solve problems.	0.5821	4.401	0.776
	Q9: In our team we tell colleagues if they are doing something considered unacceptable.	0.4341	4.276	0.861

Source: Elaborated by the authors.

\*Cronbach's alpha.

The total variance explained by the four factors is 61.12%. This result is satisfactory, as it presents a percentage of total variance higher than the acceptable limit suggested by the literature (Hair et al., 2005). Although variables Q9, "We often discuss how to deal with day-to-day difficulties," and Q18, "In our team, there is a balanced distribution of tasks among members," present low factor loadings (less than 0.500), so we chose to keep them in the study. If Q18 were removed, the value of Cronbach's alpha of the collective spirit factor would be lower. Q9, on the other hand, was maintained due to the number of variables in the factor because if the variable were removed, the relationship factor would only have two variables representing it.

The analysis results regarding the factors show that the variable "People are interested in getting to know their colleagues better" of the **collective spirit** factor stood out as the most significant weight among the

analyzed variables (factor loading of 0.8440). Two other variables were also identified as more associated with this factor, "My colleagues encourage me to achieve or exceed my personal and professional goals" (factor loading of 0.8001) and "In difficulties, my teammates usually help me" (load factorial of 0.7795).

The collective spirit factor is understood as an understanding of the actions connected in the system, generating a sense of interdependence and vision of the process (Klein & Bitencourt, 2012). It reproduces and reformulates the shared understanding of team members about their work and establishes the basis of collective competence (Bitencourt et al., 2013).

In the **interaction** factor, the main variables were "In the tension in our team, we admit and talk about it" (factorial load of 0.7868) and "Be aware of the climate of our team" (factorial load of 0.7576). Interaction is recognized as a shared space for debating and defining

team activities or exchanging experiences (Sandberg & Tagarma, 2007; Frohm, 2002; Hansson, 2003; Le Bofert; 2003) and enabling the development of collective competencies (Klein & Bittencourt, 2012).

In the **cooperation** factor, the highlighted variable was "My colleagues participate in the team's decisions with their suggestions" (factor loading of 0.7271). Cooperation is seen as an essential factor to maintain and facilitate relations of solidarity between members and ensure the cohesion of working groups (Dupuich, 2011). In addition, Felix et al. (2019) state that cooperation is sharing the meaning of wanting to do it together, providing guidance when doing it, and indicating the value and subjective relevance of acting in common.

Finally, in the **relationship** factor, the primary variable was "Our team's relationship is supported by cooperation" (factor loading of 0.6756). Relationship

practices mobilize the configuration of collective competencies, combining events and actions aimed at integration and cooperation in individual work (Silva & Ruas, 2014). The relationship also enables the sharing of knowledge, allowing teams to establish social relationships so that the integration of their members takes place (Silva et al., 2021).

After the factor analysis, the variance (ANOVA) analysis of the factors of collective competencies was carried out. This test was conducted to indicate whether each factor was different for fashion design teams. Participants were classified into 22 groups according to the team they were on. In this way, the 22 teams were analyzed with the factors found for collective competencies. Table 4 shows the ANOVA of the teams concerning the factors of collective spirit, interaction, cooperation, and relationship.

**Table 4**  
Variance Analysis - explanatory factors

<b>Collective Spirit</b>					
	Sum of squares	df	Mean Square	F	Sig.
Between groups	45.4603031	21	2.16477634	2.97	<b>0.0002*</b>
In groups	65.5396961	90	.728218846		
Total	110.999999	111	.999999993		
<b>Interaction</b>					
	Sum of squares	df	Mean Square	F	Sig.
Between groups	45.9636314	21	2.18874435	3.03	<b>0.0001*</b>
In groups	65.0363697	90	.72262633		
Total	111.000001	111	1.00000001		
<b>Cooperation</b>					
	Sum of squares	df	Mean Square	F	Sig.
Between groups	28.0359968	21	1.33504747	1.45	0.1177
In groups	82.9640042	90	.921822269		
Total	111.000001	111	1.00000001		
<b>Relationship</b>					
	Sum of squares	df	Mean Square	F	Sig.
Between groups	30.8896618	21	1.47093628	1.65	0.0545
In groups	80.1103373	90	.890114858		
Total	110.999999	111	.999999991		

Source: Elaborated by the authors.

There was a statistically significant difference between the groups in the collective spirit factor, as determined by ANOVA ( $p = 0.002$ ). This difference means that at least one of the teams' averages is different in this factor since the significance was less than 0.05. The

collective competence factor depends on the team of which the employee is a part and may have greater ease or difficulty acquiring it. Therefore, it is necessary to identify which mean differs from the others, and for this, Tukey's Post Hoc analysis was performed (Table 5).

**Table 5**  
Tukey test - Collective Spirit Factor

Teams	Average	Standard error	P-value	Confidence interval	
				Lower Limit	Upper Limit
20 vs 11	-2.098777	.5508398	0.037	-4.139493	-.0580607
21 vs 11	-1.964153	.4926861	0.021	-3.789425	-.1388812
22 vs 11	-1.887854	.4926861	0.034	-3.713126	-.0625818

Source: Elaborated by the authors.

Tukey's Post Hoc test revealed that the collective spirit factor was statistically significant in the teams: 20 compared to 11 ( $p = 0.037$ ), 21 compared to 11 ( $p = 0.021$ ), and 22 compared to 11 ( $p = 0.034$ ), as shown in Table 5. However, there were no statistically significant differences between the other groups of fashion design

teams. For this reason, the data from the other teams were not exposed.

Another factor that presented a statistically significant difference between the groups was the interaction factor, as verified by ANOVA ( $p = 0.001$ ) (Table 4). This result demonstrates that this factor of collective competence depends on whether the team is to

be obtained easily or not. As at least one of the teams' averages was different in this factor, it is essential to

identify the different averages. Tukey's Post Hoc analysis was performed, shown in Table 6.

**Table 6**  
Turkey Test – Interaction Factor

Teams	Average	Standard error	P-value	Confidence interval	
				Lower limit	Lower limit
16 vs 09	-2.32138	.6010933	0.031	-4.548272	-.0944885
16 vs 10	-1.888294	.4907906	0.033	-3.706544	-.0700446
16 vs 11	-2.326077	.5487206	0.009	-4.358942	-.2932124
16 vs 12	-2.790013	.6010933	0.002	-5.016905	-.563121
21 vs 12	-2.217145	.5487206	0.018	-4.25001	-.1842802
16 vs 14	-2.126886	.5487206	0.030	-4.159751	-.0940215
17 vs 16	2.386247	.5328123	0.004	.4123185	4.360176
20 vs 16	2.241123	.6010933	0.047	.0142314	4.468015
21 vs 17	-1.813379	.4729377	0.034	-3.565488	-.0612703

Source: Elaborated by the authors.

From these data, it can be seen that the interaction factor was statistically significant in more teams than the collective spirit factor. The interaction factor showed significance in 9 different groups: 16 compared to 9 ( $p = 0.031$ ), 16 compared to 10 ( $p = 0.033$ ), 16 compared to 11 ( $p = 0.009$ ), 16 compared to 12 ( $p = 0.002$ ), 21 compared to 12 ( $p = 0.018$ ), 16 compared to 14 ( $p = 0.030$ ), 17 compared to 16 ( $p = 0.004$ ), 20 compared to 16 ( $p = 0.047$ ) and 21 compared to 17 ( $p = 0.034$ ).

Regarding the ANOVA shown in Table 3, the means of the teams regarding the cooperation factor and the relationship factor are statistically equal since the degree of significance was 0.1177 and 0.0545, respectively, that is, values greater than 0.05, suggesting that cooperation and relationships are common collective competence factors in all analyzed teams.

The results showed, through factor analysis, the main variables and the main factors that explain the collective competencies in fashion design teams. These identified factors (collective spirit, interaction, cooperation, and relationship) proved to be defining and essential attributes for collective competencies. Thus, it is possible to compare these results with other studies on collective competencies.

Klein and Bitencourt (2012) and Silva and Ghedine (2020) presented the collective spirit as a constitutive element of collective competencies. Klein and Bitencourt (2012) report that the collective spirit is strengthened in teams during work activities with tight deadlines, regardless of the roles performed by its members. In a study carried out with fashion teams, Silva and Ghedine (2020) demonstrate that the collective spirit includes a dynamic of collective commitment to achieve goals, such as meeting goals or solving team problems.

In interaction, Klein and Bitencourt (2012) demonstrate that it is possible to observe the complexity of relationships involved by the mobilization of workgroups according to a common objective, where collective competencies would be developed from the interaction between different workgroups. For Silva and Ghedine (2020), interaction allowed exchanges between team members and shared understanding. In the fashion teams, the moments of more significant interaction

perceived in their study were at the conference of garments, meetings, brand conventions, and research trips.

Silva and Ghedine (2020) also pointed out that cooperation was essential for fashion teams in meeting goals, overloading work, or providing help to employees. Macke and Crespi (2016) pointed to cooperation as an explanatory factor of collective competence. The authors carried out an empirical study with information technology teams and found cooperation as one of its explanatory factors. The results demonstrate a Cronbach's alpha of 0.849 for the cooperation factor, a value higher than that found in this study (0.5899).

The relationship was a mobilizing factor of collective competencies identified in a study carried out by Silva and Ruas (2016) in a company in the financial sector. The relationship was also a factor identified by Macke and Crespi (2016), which they named "interpersonal relationship." Through multiple transactions, the authors state that many contents are exchanged in the work teams by their members, influencing attitudes, thoughts, and ways of acting. The results show a Cronbach's alpha of 0.743 for the interpersonal relationship factor, a higher value than this study (0.5252).

Through analysis of variance, two factors showed statistically significant differences between the groups (collective spirit and interaction), demonstrating that these two factors are considered the most divergent in the analyzed teams. Regarding the collective spirit, this may be linked to the fact that in some teams, personal interests can prevail over collective interests, making it impossible for the team to create a "spirit." Alternatively, when individual goals lose relevance and the team sets appropriate goals for everyone. Thus, the team can do its best when its members boost their individual and collective goals (Silva et al., 2014).

In interaction, differences between teams may be linked to the composition of their members. Staffing is related to the members' competence, the number of people in the sector, and the allocation by profile in each coordination. The development of collective competencies at work can be favored by the individual's

potential and by a team with an adequate number of people distributed according to their abilities (Lima & Silva, 2015). Thus, a team needs to function well to be formed with the "best possible" and has a healthy social interaction among its members (Einola & Alvesson, 2019).

On the other hand, two factors are common in all fashion design teams (cooperation and relationship). Cooperation is considered an existential component of collective competence. Knowing how to cooperate assumes the collaboration of team members with different cultures, resources, statutes, or cognitive procedures. It concerns daily cooperation and mutual help, in which speech and discussion occur to find a solution to a problem so that people help each other and listen to the other's point of view (Le Boterf, 2003). On the other hand, relationships are considered by Silva and Ruas (2016) as a mobilizing factor for collective competencies, that is, encouraging and reinforcing the processes of interaction and cooperation in individual work. In addition, Puente-Palacios and Borba (2009) state that forming collective properties is favored by the performance of tasks performed together and by the daily relationship of people.

## 5 CONCLUSIONS

This study demonstrates that the discussion about collective competencies is complex, heterogeneous, and has multiple interpretation and analysis possibilities. This article aimed to identify the factors that explain the collective competencies through a quantitative survey with 22 fashion design teams from Santa Catarina. It was noticed that there was a manifestation of the following explanatory and essential attributes for collective competencies: collective spirit, interaction, cooperation, and relationship.

The analysis results support the notion that these factors demonstrate that the development and maintenance of collective competencies will only occur if they go beyond the sum of individuals. In this sense, one person added to another can represent none, two, or even a hundred, depending on how work relationships, articulations, and organization occur. In addition, the detailed and precise analysis of the results achieved through factor analysis and analysis of variance favor the manifestation of four defining attributes.

The involvement of everyone characterizes **cooperation** (factorial load 0.5889) to achieve common goals, participation with suggestions, and good interlocutions with other teams; the **relationship** (factorial load 0.5252) seeks creative solutions, cooperative, transparent, and honest work, especially when someone is doing something unacceptable; **interaction** (factor loading 0.7809), can be understood as an excellent organizational climate and openness to talk with colleagues to resolve tensions and difficulties; and the

**collective spirit** (factorial load 0.8895), it is also characterized as the demonstration of caring for each other, recognition of efforts, knowledge sharing, search for incentives that stimulate the motivation and overcoming of each one, collaboration in carrying out activities, interest in getting to know colleagues better, identifying team members' strengths and weaknesses, and balanced distribution of tasks.

The findings demonstrate how relevant these factors are in the composition and formation of groups. It was also identified that the collective spirit and interaction were divergent elements in the analyzed teams, as determined by their degrees of significance ( $p = 0.002$ ) and ( $p = 0.001$ ), respectively, and detailed using Tukey's Post Hoc test. Furthermore, this leads to considering some essential points: i) thinking about the collective and understanding this collection goes far beyond working together. It is necessary to know and respect the different people so that it is possible to develop relationships of identification with members, and this takes time. The choice of who makes up the teams is conditioned. It is justified by the highlight of the variable "In our team, people are interested in getting to know their colleagues better" (Q16); ii) the sense of interdependence can be mobilized through interaction. Knowledge exchange and sharing are related to how people organize themselves and understand that being together is much more than sharing. It is about achieving personal goals, highlighted by the variable "When there is tension in our team, we admit it and talk about it" (Q5). The collective spirit and interaction factors were identified as different in all teams. It may be linked to the composition of its members.

Another finding that deserves to be highlighted is that the other two factors, cooperation, and relationship (significance degrees 0.1177 and 0.0545 respectively), were identified as common to all investigated teams. It leads us to understand that these would be elements with a predisposition to existence since the sense of cooperation. However, it requires collective thinking. It is possible to have an individual doing, and maybe that is why it is more present, even because it seeks common goals is different from awakening shared goals, as signaled earlier. Furthermore, analyzing the relationship issue, these combinations of events and actions and the establishment of social relationships and integration can occur almost naturally due to the need for group work, as evidenced by the variable "Our team's relationship is sustained by the cooperation" (Q1). In this sense, an important question arises: would these elements be present in all teams because they would be essential for collective competencies? Or would this presence occur due to the relationship and organization of work?

The findings indicate that a synergistic combination of factors (cooperation, relationship, interaction, and collective spirit) represents people's capacity to think and collaborate — developing shared actions in favor of the organization based on interactions and visions. Which,

even though they are different, can be shared. Thinking and acting in favor of shared goals changes how people get involved and engage in work, awakening the feeling of belonging and interdependence, elements also relevant in the discussion of collective competencies and, consequently, healthy work relationships, respecting, and reiterating the motto highlighted above.

In conclusion, the construction of this study and the entire review carried out. The path is taken in terms of research regarding collective competencies points to the fact that it is necessary to have and awaken a collective feeling of being and doing collectively, which is complex but can be developed from the elements of relationship and cooperation, as identified in this study. In other words, we emphasize that this presence is not natural but built and consolidated over time. Even so, other factors such as team spirit and interaction must coexist. However, it is necessary to think more deeply about the composition of the teams. Teams encourage collaborative development, not just individual. It still presents itself as a challenge for both organizations and society.

This study also points to managerial/practical contributions, such as identifying factors that explain collective competencies, allowing teams to understand their collective work activities better, and working on issues that aim to improve their performance to contribute to the organizational results. For the fashion industry, this study also presents factors capable of forming or developing collective competencies for teams that work with collective creativity processes and develop fashion collections in a shared or familiar way.

Although we can point out some limitations in this study, the survey was applied only to companies from Santa Catarina, not allowing generalizations to other areas of Brazil and other sectors. The nature of the analyzed phenomenon leads us to question how much can be inferred statistically from a socially complex phenomenon. Such as collective competencies and the interrelationships of the components that compose it do not invalidate the study or make it irrelevant. It points to compelling evidence to be qualitatively explored. Because of this, we suggest for future research: expansion of the research scope; use of the collection instrument in other work teams in different sectors; relationships between the factors identified by this study, in addition to qualitatively exploring the evidence presented here.

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