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Cooperation, competition and goal interdependence in work teams: a multilevel approach

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The aim of this research was to predict cooperative and competitive conflict management styles in 26 new start-up work teams (time 1), and after one year of functioning (time 2) in an automotive company. Vertical-horizontal, individualism-collectivism cultural patterns were used as predictive variables. It was predicted that goal interdependence would moderate the relationship between cultural patterns and conflict management styles. Because of the hierarchically nested data structure, a Multilevel Analysis approach was used. Horizontal and vertical collectivism increased cooperation, and horizontal and vertical individualism increased competition. Only when work teams had been functioning for a year, goal interdependence increased cooperation and interaction effects between goal interdependence and vertical types of individualism and collectivism were observed. Implications for teambuilding as organizational transformational strategies are discussed.

Cooperación, competición e interdependencia de objetivos en los equipos de trabajo: un enfoque multinivel. Este trabajo trata de predecir estilos de manejo de conflictos cooperativos y competitivos en 26 equipos de trabajo de reciente construcción (tiempo 1) y tras un año de funcionamiento (tiempo 2) en una compañía de automoción. Los cuatro patrones culturales de individualismo-colectivismo, horizontal-vertical, fueron considerados como variables predictoras. Se hipotetizó que la interdependencia de objetivos moderaría la relación entre los patrones culturales y las conductas de manejo de conflictos. Dada la naturaleza jerárquica de los datos (individuos anidados en equipos) se utilizó una estrategia de análisis multinivel. Los patrones individualistas se mostraron asociados positivamente con la competición, mientras que los colectivistas lo hicieron con la cooperación. La interdependencia de objetivos se asoció con mayores niveles de cooperación únicamente en el tiempo 2. Asimismo, se produjeron efectos de interacción entre la interdependencia de objetivos y los tipos de individualismo y colectivismo verticales. Se discuten las implicaciones de los resultados para la construcción de equipos como estrategias de transformación cultural de las organizaciones.

Building team-based working organizations has become a key activity for human resource practitioners and departments (West & Markiewicz, 2004). During the last 60 years many organizational psychology theorists have offered comprehensive models for the study of dimensions of teamwork (for a review see Yeatts & Hyten, 1998). In addition to other dimensions, some models have focused on tasks and socio-emotional needs, job-enriching activities, team reflexivity and work team characteristics (Salas, Stagl, & Burke, 2004).

However, as West (1996) mentioned, few authors have integrated these approaches from a longitudinal and multilevel point of view. This study aims to advance our knowledge of work and cultural psychology from a hitherto unexplored starting point. We focus on the relationship between intra-organizational cultural value orientation and goal interdependence in predicting conflict management styles. Conflict management behaviour has become an essential concept in work and organizational psychology (Wagner, 1995). In this study we consider goal interdependence both as a predictor of competitive and cooperative styles and as a moderating variable in the relationship between cultural patterns and conflict management styles.

The aim of this study, therefore, is to predict cooperative and competitive conflict management styles from two angles: first, from the perspective of cultural patterns, taking vertical-horizontal, individualism-collectivism dimensions as predictive variables (Triandis & Gelfand, 1998), and second, from the perspective of group effectiveness, taking goal interdependence in teams as a predictor and moderating variable (Campion, Medsker, & Higgs, 1993). As the association between personal and group goals may define the best suited strategy for managing conflict, we also explore whether goal interdependence moderates the relationship between cultural patterns and conflict management styles.

Cultural patterns and conflict management

Throughout the nineteenth and twentieth centuries many concepts were used by different schools of thought to refer to the

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constructs of individualism and collectivism. For example, political philosophers analysed the nature of the relationship between the individual and the state. In cultural psychology, the strongest basis for the development and understanding of individualism and collectivism has come from sociologists and anthropologists (Kluckholm, 1956). Cross-cultural studies have found differences in behaviour between individualists and collectivists. Attributes like the definition of self, goal structure and preference for personal or social interests are used to explain these differences (Oyserman, Coon, & Kemmelmeier, 2002). While many dimensions have been studied, Triandis (1995) highlighted the vertical and horizontal dimensions as the two most important types of individualism and collectivism.

Horizontal Collectivists (HC) do not accept inequality between members and see themselves as a part of their in-group. The self is interdependent on others, and is perceived as the same as the self of others. In this pattern, in-group identification and similarity to others are highly valued. Vertical Collectivists (VC) perceive themselves as different from each other, and accept disparities between in-group members. In this pattern individuals see the self as a part of the in-group; group identification, a sense of duty and sacrifice for the group's demands are valued.

Horizontal Individualists (HI) postulate an autonomous self. They see themselves as independent from others, but equal to them. High self-reliance and low interest in reaching high status are reflected in this pattern. Vertical Individualists (VI) postulate an autonomous self but see each other as different; inequalities are expected. In this pattern, competition between individuals appears as a natural way to handle conflict. High VI pursue distinction, high status and competition with others (Singelis, Triandis, Bhawuk, & Gelfand, 1995).

Cross-cultural literature has shown that collectivist cultures tend to utilize integrative conflict management styles (Rahim, 1988). These styles try to maximize results for both parts in a conflict, using cooperation, avoidance or submission behaviours. Moreover, research has found evidence relating the collectivist orientation in work teams to cooperative behaviour (Eby & Dobbins, 1996). Individualist cultures, on the other hand, are more inclined to utilize distributive styles to deal with conflict, that is, competitive behaviour aimed at maximizing the results of one of the parties to the detriment of the other (Leung, 1997). Bearing in mind that analyses of cultural and individual differences may be complementary (Triandis, 1996, p. 412), and that isomorphic principles may govern attributes defining culture constructs (Chao, 2000), cross-cultural and cross-national evidence provides the key to making a parallel distinction at the individual level in a single organization (Aritzeta, Ayestaran, & Balluerka, 2003).

Focusing on the individual level, the definition of the self for each cultural pattern orientation has become a major concern among researchers. The exact content and structure of the inner self may differ considerably from the broader concept of national culture. Divergences in self-definition play an important role in individual experiences: a person with an individualistic orientation defines his/her self as an independent entity, whereas a collectivist person defines his/her self as an interdependent entity in which significant others (individuals and groups) are included (Markus & Kitayama, 1991). This self-definition implies that, in interdependent situations, variations in certain cultural patterns will influence personal orientations to cooperate or to compete (Sánchez & Alonso, 2004). In this individual level approach, Rabie (1994) proposes that in the conflict management process culture takes on the role of mediator, defining the values and interests at the core of the conflict. In turn, this role strongly determines actors' perceptions of themselves and of other actors. This decisive influence clearly affects the conflict management styles the actors use when dealing with a conflict situation. Against this theoretical background, we hypothesize that:

Hypothesis 1: Vertical-Horizontal collectivist cultural patterns will lead to higher levels of cooperation.

Hypothesis 2: Vertical-Horizontal individualist cultural patterns will lead to higher levels of competition.

Goal interdependence and conflict management

Classical group effectiveness theories have focused on multiple input and process characteristics responsible for attitudinal and productivity outcomes in groups (Salas, Stagl, & Burke, 2004). Interdependence is a defining characteristic of teamwork. Several forms of the phenomenon have been examined in the literature, including reward and feedback interdependence. Goal interdependence, defined as a situation in which members of a group share common goals, is one of the most widely studied forms (Yeatts & Hyten, 1998). In our research we used the definition by Campion et al. (1993), that is, goal interdependence is «the degree to which personal and group goals are related».

In high positive interdependent contexts (Deutsch, 1973), establishing goals for both groups and individuals has been defined as «an optimal strategy to increase group outcomes through cooperation» (Locke & Lathman, 1984, p. 37). Goal setting strategies and equal reward systems tend to enhance cooperation in teams (Gordon, Welch, Offringa, & Katz, 2000). The establishment of group goals plus individual goals promotes cooperation in groups and has a beneficial effect on motivational aspects of members' behaviour, increasing the positive goal interdependence perception among group members (Weldom & Weingart, 1993).

The fit between personal and team goals is a critical feature for team effectiveness. When individual and group goals appear together they increase motivational outcomes (Mitchell & Silver, 1990). It has been widely argued that teams enhance their organizational effectiveness by increasing cooperative behaviour. Similarly, the responsibility for decision-making and the existence of opportunities for participation aid cooperation in teams. In the same way, the awareness of goal interdependence favours the integration of personal resources in search of a common goal and thus increases cooperation (Weldon & Weingart, 1993). By definition, interdependence requires people to work together, and individuals working together need to develop cooperative strategies to be successful. Thus, as the task itself is an issue requiring cooperation, goal interdependence should increase cooperative behaviour in teams. Therefore we expect that:

Hypothesis 3: Goal interdependence will predict higher levels of cooperative conflict management style.

The link between goal interdependence and the competitive style is not as straightforward as that between goal interdependence and the cooperative style.

It has been argued that individualists (who are centred on their individual work) and collectivists (who are group-dependent) tend

to react to different aspects of self-managing teamwork; individualists react to collective work whereas collectivists react to self-management (Kirkman & Shapiro, 1997). Thus, team-based working can be expected to reduce the natural resistance of individualists to team or collective work and the resistance of collectivists to self-management. Self-management requires a considerable degree of autonomy. The actual need for personal knowledge specialization and for individual contributions in the search for excellence and innovation in work teams, may activate a process of differentiation characterized by a reduction of resistance to individual autonomy and by an enhancement of the importance given to each person's contribution to work. In positive interdependent contexts, differentiation facilitates the simultaneous pursuit of personal and team goals, allowing the combined use of cooperative behaviours (to achieve group goals) and competitive behaviours (to achieve personal goals) without threatening the team's existence (Ayestaran, 1999). In other words, when team-based working is implemented in collectivistic group-dependent organizational cultures (as the one in our sample), team members realize that in order to increase effectiveness in this more complex work system, each worker should give of his/her best, expressing personal opinions and openly discussing them with other members in the search for effective solutions to problems.

With the new work system implemented in the organization of this study, work group sizes were reduced and higher autonomy was given to teams as well as to individuals (see procedure). New communication and decision making processes were created which required higher individual reflexivity (West, 1996).

In this inherent process of differentiation in which each person underlines his/her own characteristics as different from others, and which allows a natural search for the fulfilment of personal goals, goal interdependence may reduce the fear of competition commonly present in collectivist cultures (Leung, 1997). To a certain degree, individuals have an interest in defending their own opinions and goals; this in turn enriches creativity and leads to effective solutions to conflicts. In this context, awareness of goal interdependence may reduce the fear of competition, allowing the use of a combination of competitive and cooperative behaviour after a period of time of successful teamworking.

Cooperation seems to be more effective when accompanied by a certain amount of competition, and vice versa (Van de Vliert, 1999). This is especially true for high interdependent contexts. The presence of a mix of cooperative and competitive motives in teams helps to reduce negative behaviours such as free riding and social loafing (Rafferty & Tapsell, 2001). In this regard, both cooperative and competitive individual level goals will contribute to group effectiveness as long as the individual goals can be expected to facilitate, rather than impede, the achievement of group goals. When individual and group goals are compatible (i.e. when there is positive interdependence) team members can be expected to use both cooperative and competitive conflict management strategies. From a longitudinal point of view, the learning processes inside teams help to integrate cooperation, personal autonomy and the ability to compete within the team (Russ-Eft, Preskill, & Sleezer, 1996). Thus after teamworking has been functioning for a year, we expect that:

Hypothesis 4: High levels of goal interdependence will lead to an increase in competitive conflict managing style at time 2.

Cultural patterns, goal interdependence and conflict management

In their analytical dimension, cultural patterns capture the relative importance people accord to personal interests and to shared pursuits (Wagner, 1995). In situations where conflict is present, collectivist patterns will look out for their group's interests, whereas individualists will accord more importance to personal interests. Therefore, the analysis of cultural patterns requires consideration of personal and group interests and goals. Previously established arguments about self-definition and its influence on personal orientation to manage conflict in interdependent situations, suggest the presence of interactive effects between cultural patterns and goal interdependence when predicting cooperative and competitive conflict management styles. At the time of this study team-based working had just been introduced in the company. Previous to this organizational restructuring (described later on) no team structures were in place, and work was not interdependently organized. Thus goal interdependence could only interact with cultural patterns after a certain period of teamworking. For this reason, we expected that interactive effects would appear only at time 2, once members had a year's experience working in a new teamwork structure.

In collectivist patterns self-definition is consistent with cooperative behaviour, and the degree to which goal interdependence is perceived by individuals will influence cooperation in teams. Collectivists have individual goals that are compatible with the goals of their in-groups, and when a conflict emerges they cooperate by prioritizing the in-group's goals (Triandis, 1995). As time goes by and team-based working becomes stabilized, the team interdependent context will encourage individuals to increase their perception of interdependence at work, showing an effect on their awareness of goal interdependence. In fact, the introduction of group-based rewards, group goals and task interdependency were among the activities that characterized the restructuring process from traditional to team-based working. Therefore, at time 2, when taking cooperation as criterion variable, we expect the relationship between collectivist patterns and cooperation to be moderated by goal interdependence. Specifically, we expect that

Hypothesis 5: The effect of collectivist patterns on cooperation will be higher with high levels of goal interdependence than with low levels of goal interdependence.

As mentioned above, high individualist orientations lead to higher levels of competitive behaviour. If a conflict between personal and group goals emerges (low goal interdependence) individualists will naturally give priority to their personal goals, using competitive behaviour (Schwartz, 1990). Based on these assumptions, and taking into account that goal interdependence is associated with cooperation, we expect that:

Hypothesis 6: The effect of individualist patterns on competition will be higher with low levels of goal interdependence than with high levels of goal interdependence.

Method

Sample

Two hundred and thirty two shift process employees (forming 26 work teams) in a cooperative automotive firm took part in the study. The age distribution of participants was 5% under 20 years,

54% between 20 and 30 years, 26% between 31 and 40 years, and 15% over 40. Around 90% of the sample was male.

Procedure

Team-based working had just started when the instruments were administrated at time 1, and had been developing throughout a year when the repeated measures were collected at time 2; thus data were collected at two times, one year apart.

The new teamwork-based system was implemented in a cooperative firm, part of the traditional Mondragón Corporate Cooperatives in the Basque Country (North of Spain). This cooperative operates in the automotive sector and produces aluminium rims supplying car manufacturers locally and in different countries. We chose a cooperative setting for this research because cooperatives represent a type of culture grounded on social values that may be challenged by the increasing competitive market as well as by the use of new working systems like work teams.

Prior to the introduction of the new teamwork-based system in the organization, workers were organized in large groups characterized by the following stages: first, a definition of the work based in individual rather than in group criteria. Second, there were no meetings for blue-collar workers to discuss work procedures. Third, workers had few opportunities for participation and self-management as well as reduced possibilities of work-related-interactions. Fourth, employees had no contact with either external suppliers or direct customers and the amount of work to be done was set by managers without feedback to workers. Fifth, groups were very large (20-40 members), and had too many members to be defined as small teams. In this context, individuals defined the nature of their group, among other criteria, via elements of space location, shift and product.

With the implementation of the teamwork system, new communication and decision processes were established following a well-defined methodology. First, an important redistribution of workers took place, requiring every team to have a small number of workers (5 to 9). Second, each team had a weekly meeting to discuss work-related problems and decision-making. A new daily «before starting work» meeting was held. Third, these teams had direct contact, through their coordinator, with their external suppliers. Fourth, they had direct contact, through their coordinator, with their external customers, who defined a negotiated amount of product to be made by each team, establishing a group goal. Fifth, they had group goals previously negotiated with their managers and, depending on the level of attainment of these goals, members obtained equally-distributed rewards, which meant that the interdependence of member-team objectives increased. In this sense, tasks that were previously unconnected were observed as parts of a bigger unit. Sixth, decisions were taken democratically (trying to find consensus) within the team and all of the individuals were expected to participate on an equal basis. It was made clear that the basis of the new teamworking structure, besides improving quality standards, was to ensure individual contribution to the decision making process, so the team could benefice from all the «minds in the team». The aim of all these changes was to ensure that these teams could access sufficient information and resources in order to encourage autonomous decision taking.

Measures

Goal interdependence was measured adapting the scale provided by Campion et al. (1993). The instrument was translated from English into Spanish using the back translation design. The Spanish version of the scale showed good psychometric properties (Aritzeta, 2002). A total of nine items composed the final scale. An example item is «My work activities on any given day are determined by my team's goals for that day».

Cultural patterns were measured by the scale provided by Singelis, et al. (1995), in which horizontal and vertical dimensions of individualism and collectivism were recorded. Research has shown that this scale possesses good reliability and validity indexes (Triandis, 1996; Triandis & Gelfand, 1998). Horizontal collectivism (HC) was composed by eight items. An example item is «If a co-worker gets a prize, I would feel proud». Horizontal individualism (HI) was composed by seven items. An example item is «I am a unique individual». Vertical collectivism (VC) was composed by four items and «I usually sacrifice my self-interest for the benefit of my group» is an example item of this dimension. Finally, vertical individualism (VI) was composed by four items. An example item is «It is important that I do my job better than others».

The scale for measuring conflict management styles was adapted from the «Management of Differences Exercise» (MODE, by Thomas & Kilmann, 1974). In order to avoid some of the questionnaire's main psychometric limitations (Van de Vliert, 1999), the statements covered by the 5 conflict management styles were turned into a 6-point Likert scale. In this way, the uncertainty associated with the hesitant respondent was reduced (Andrich, Jong, & Sheridan, 1997). Cooperation and competition have been regarded as core dimensions on which the rest of taxonomies relay. Van de Vliert and Euwema (1994) stayed that, «the metataxonomy of agreeableness and activeness», which in fact are directly linked to cooperation and competition «reflects antecedent taxonomies (Deutsch, 1973; Blake & Mouton, 1964) permitting to interrelate all types of conflict behaviour» (p. 676). As we were interested in cooperative and competitive styles, a principal component analysis with varimax rotation was carried out with the 28 items of the scale. This analysis provided the adequate two factor solution. These two unipolar factors showed eigenvalues of 4.18 for cooperation and 2.2 for competition and explained, respectively, the 26.17% and the 13.77% of the total variance. Cooperation was composed by nine items and defined by «integrating different points of view», «searching for common standpoints» and «finding adequate solutions for both parties in conflict». The competitive style was composed by four items and defined by forcing ones own standpoint. For example, «pressing to maintain ones own position» or «searching strongly to attain ones own goals».

Data analysis

Data were examined by means of a multilevel analysis (Goldstein, 1995; Hox, 2002). MlwiN package (version 2.0) was used to carry out such analysis (Rasbash et al., 2000). Taking cooperation (see table 2) and competition (see table 3) as criterion variables, we tested three different models one month (time 1) and one year (time 2) after starting-up with a new team work based system. In each model we calculated the estimates and standard errors of fixed and random parameters, the intraclass correlation,

the percentage of reduction in unexplained individual and group level variance resulting from adding new explanatory variables to the previous model, and the deviance of the model. The difference between the deviance statistics was used to compare the different models with respect to predictive power. If the initial model is a reduced version of the subsequent model, as they were the models in our study, this difference follows a χ^2- distribution under *Ho* that the extended model does not predict better than the reduced model. In order to reduce multicollineality and to better interpreted results, predictive variables were centred around the overall mean.

Results

Means, standard deviations, Cronbach's alphas, Pearson product-moment correlations, and the statistical significance tests (Student's t-s) of the differences between means of time 1 and 2 of the study variables are presented in table 1.

The Student t-s showed a statistically significant reduction of both collectivist patterns at time 2 and an increment of the vertical individualism pattern. Intercorrelations between variables were generally low or average between cooperation and collectivist patterns and between competition and individualistic patterns.

Model tests

Cooperation as criterion variable

The results of the multilevel regression analyses taking cooperation as criterion variable are given in table 2.

The results obtained in the first model (model 1) at time 1 showed that, as it was expected, when cultural patterns were taken as explanatory variables model fit improved ($\Delta D = 98.14$; $p \leq 0.01$) and unexplained variance at the group (41.86%) and at the individual (24.87%) levels decreased. Furthermore, the fixed coefficients for HC ($z = 7.67$) and for VC ($z = 2.44$) showed that, at this time, both cultural patterns led to an increase on cooperation. The small standard errors of the two coefficients allow us to regard them as reliable estimates of their corresponding effects. A similar pattern of results was observed at time 2. In this case, the *z*-scores of the fixed coefficients for HC and VC were 6.9 and 3.5, respectively, leading us to conclude that they both had a positive influence on cooperation. The improvement in model fit was statistically significant ($\Delta D = 87.36$; $p \leq 0.01$). A reduction of 60.71% in the between-group unexplained variance and of 28.73% in the within-subject unexplained variance was observed.

In model 2 goal interdependence was entered as predictive variable. At time 1 the fixed coefficient for this variable did not show statistical significance. However, at time 2, after a year of team-based working, the fixed coefficient for goal interdependence showed a positive influence on cooperation ($z = 2.78$). The model fit improved by 7.53, which was a statistically significant improvement ($p \leq 0.05$). A reduction of 27.27% in the between-group unexplained variance and of 2.01% in the within-subject unexplained variance was observed.

In model 3 the interaction terms between cultural patterns and goal interdependence were added to the previous model. At time 1, none of these interactions was statistically significant. However, at time 2, there was a statistically significant interaction between VC and goal interdependence ($z = 2.69$). This interaction showed that the effect of VC on cooperation increased by 0.143 points when goal interdependence moves from low to high values. It is important to note that once interactions were entered at time 2, the overall model fit improved ($\Delta D = 9.86$; $p \leq 0.05$), and a reduction of 12.5% in between-group unexplained variance and of 4.52% in within-subject unexplained variance was observed.

Competition as criterion variable

The results of the multilevel regression analyses taking competition as criterion variable are given in table 3. It must be pointed out that, at time 1, the group level variance was close to zero, so executing a regression analysis over the total sample of workers, ignoring team membership, would have been appropriate. Anyway, we decided to use multilevel analysis because we expected to find a higher intergroup variability in competition at time 2 than at time 1, which makes it suitable to use multilevel analysis approach.

Model 1 showed, that HI ($z = 4.36$) and in VI ($z = 5.29$) were related with an increment on the competitive style at this time. A similar pattern of results was observed at time 2. In this case, the

Table 1
Preliminary analysis: means, standard deviations, intercorrelations and t-tests of variables in time 1 (down the diagonal) and time 2 (above the diagonal)

	M(SD)	Alpha	t	1	2	3	4	5	6	7	8	9
M				2.59	1.79	4.44	4.36	3.88	4.68	4.34	3.46	3.02
(SD)				(.94)	(.90)	(.91)	(.61)	(.76)	(.56)	(.68)	(1.02)	(.92)
Alpha				–	–	.49	.79	.64	.76	.52	.77	.79
1. Age	2.62 (.95)	–	–		-.08	.008	-.07	.005	-.13*	-.04	.07	-.02
2. Job Tenure	1.94 (.91)	–	–	.67**		.09	-.001	.03	-.07	-.01	.08	-.03
3. Goal Interdependence	4.38 (.92)	.51	-.21	.01	.03		.31**	-.02	.26**	.26**	.05	.13*
4. Cooperation	4.45 (.66)	.81	-.51	-.004	.009	.26*		.22*	.52**	.40**	.003	.07
5. Competition	3.85 (.77)	.64	.69	-.09	-.05	.12	.015		.07	.10	.35**	.31**
6. Horizontal Collectivism (HC)	5.07 (.55)	.74	7.65**	-.02	-.08	.31**	.50**	.11		.46**	.02	.11
7. Vertical Collectivism (VC)	5.16 (.96)	.43	10.6**	.12	.03	.11	.23**	.04	.24**		.02	.33**
8. Horizontal Individualism (HI)	3.64 (1.33)	.74	1.79	-.15*	-.11	.06	.05	.31**	-.01	-.008		.30**
9. Vertical Individualism (VI)	2.84 (.93)	.67	-2.15*	.13	.06	.14*	-.06	.34**	.02	-.01	.13*	

Note: Variables: Age, Job Tenure, Goal Interdependence, Conflict Management Styles (4-5), and Group level Cultural Profiles (from 6 to 9). * p<.05; ** p<.01

z-scores of the fixed coefficients for HI (*z*= 4.63) and VI (*z*= 3.31) led us to conclude that both had a positive influence on competition. The improvement in model fit was statistically significant (ΔD= 46.03; p≤0.01). Furthermore, a reduction of 79.31% in the between-group unexplained variance and of 14.59% in the within-subject unexplained variance was observed.

Goal interdependence was entered as an additional explaining variable in model 2. The fixed coefficient for this variable was not statistically significant neither at time 1 nor at time 2. However, the sign of the coefficient changed from positive at time 1 to negative at time 2.

In model 3 the interaction terms between cultural patterns and goal interdependence were added to the previous model. None of the interaction terms was statistically significant at time 1. The results obtained at time 2 were something different. At this time, the interaction term between VI and goal interdependence (*z*= 2.26) was statistically significant. This interaction showed that when goal interdependence moved from low to high values the relationship between VI and competition increased by .122 points. Entering interactions at time 2 provided a significant improvement in model fit (ΔD= 9.51; p≤0.05). Finally, a reduction of 37.5% in between-group unexplained variance and of 3.21% in within-subject unexplained variance was observed.

Discussion

In this study we have used a multilevel regression analysis to predict cooperative and competitive styles on the basis of cultural pattern (Triandis, 1995) and goal interdependence (Campion et al., 1993) approaches. Our predictions in hypothesis 1 and 2 were fully confirmed: collectivist profiles led to cooperative style at both times (at baseline and after one year) whereas individualist profiles led to an increase in competitive style. Our study corroborates the idea that differences in cultural patterns affect cooperative and competitive styles within a single organization (Rabie, 1994; Wagner, 1995; Leung, 1997). Similarly, this study shed some light on the question of whether collectivist-individualist orientations reflect homogeneous composition of individuals in the same nation or even in the same organization (Cialdini, Wosinska, Barrett, Butner, & Gornik-Durose, 1999) showing that isomorphic principles govern attributes defining culture at national and organizational levels.

Hypothesis 3 proposed that goal interdependence would lead to higher levels of cooperation at times 1 and 2. This hypothesis was confirmed only for time 2. Probably, at time 1, as work teams had only recently been formed, team members had not had enough time to interact with each other to strongly associate goal

Table 2
Results of the multilevel analyses taking cooperation as criterion variable (p-Values based in two-tailed *z* distributions and deviance estimations based on -2*log-likelihood algorithm of Iterative Generalized Least Squares –IGLS–

	TIME 1 (MODELS)				TIME 2 (MODELS)			
	0	**1**	**2**	**3**	**0**	**1**	**2**	**3**
Grand Mean (β_{0j})	**4.441 (.060)**	**4.377 (.123)**	**4.381 (.122)**	**4.397 (.122)**	**4.364 (.048)**	**4.373 (.044)**	**4.360 (.038)**	**4.365 (.039)**
Individual Level Characteristics								
Age		-.026 (.057)	-.025 (.057)	-.036 (.057)		-.002 (.002)	-.001 (.002)	-.002 (.002)
Job Tenure		.077 (.059)	.071 (.059)	.079 (.059)		.001 (.002)	.001 (.002)	.001 (.002)
Cultural Patterns								
Horizontal Collectivism (HC)		.568** (.074)	.539** (.077)	.566** (.078)		.457** (.066)	.429** (.066)	.450**(.066)
Vertical Collectivism (VC)		.100* (.041)	.097* (.041)	.085* (.042)		.198* (.057)	.176* (.057)	.170* (.057)
Horizontal Individualism (HI)		.024 (.029)	.023 (.029)	.016 (.029)		-.003 (.034)	-.005 (.033)	-.013 (.033)
Vertical Individualism (VI)		-.044 (.042)	-.053 (.042)	-.048 (.044)		-.027 (.04)	-.032 (.040)	-.043 (.039)
Goal Interdependence			.059 (.045)	.056 (.046)			.103* (.037)	.080* (.037)
Interaction Terms								
HC * G-I				.020 (.081)				.071 (.064)
VC * G-I				-.073 (.039)				.143* (.053)
HI * G-I				.022 (.031)				-.025 (.031)
VI * G-I				.012 (.046)				.094 (.059)
Variance Components								
Individual level	.402 (.039)	.302 (.017)	.300 (.031)	.295 (.030)	.348 (.034)	.248 (.024)	.243 (.024)	.232 (.023)
Group level	.043 (.025)	.025 (.031)	.023 (.017)	.022 (.016)	.028 (.019)	.011 (.011)	.008 (.010)	.007 (.010)
Model Fit								
Deviance (D)	463.520	365.375	363.701	359.446	447.859	360.495	352.967	343.101
Δ model 0 (ΔD)		98.145**				87.364**		
Δ model 1 (ΔD)			1.647				7.528**	9.866*
Δ model 2 (ΔD)				4.255				
Δ df		6	1	4		6	1	4
Individual level R^2		24.87%	0.66%	1,66%		28.73%	2.01%	4.52%
Group Level R^2		41.86%	12%	4,34%		60.71%	27.27%	12.5%
Intraclass correlation (p)	.0966	.0764	.0712	.0694	.0745	.0424	.0318	.0292

* p<.05; ** p<.01

interdependence with cooperation. However, at time 2, after a year of team-based working, team members conceived individual and team goals as related and used more cooperative style. So with time goal interdependence becomes a stronger predictor for cooperation within teams. We therefore conclude that the higher the perceived relationship between personal and group goals, the higher the level of the cooperative style. Our results corroborate other studies that have established relationships between goal interdependence and cooperation (Johnson & Johnson, 1989; Janssen, Van de Vliert, & Veenstra, 1999).

The lack of association between goal interdependence and competition at time 2, leads us to reject hypothesis 4 which predicted that a process of differentiation (in which each person underlines his/her own characteristics as different from others, and which allows a natural search for the fulfilment of personal goals) would favour the reduction of fear of competition commonly present in collectivist cultures. However, we cannot sustain that goal interdependence predicts competitive conflict managing style on the basis of a teamwork differentiation process. If team-based working can be expected to reduce the natural resistance of collectivists to self-management, it should do so under high levels of autonomy. If team based working is created but teams and individuals are not empowered, then the expected self differentiation process may not take place.

Significant interactions were predicted for vertical-horizontal collectivist and individualist cultural patterns with goal interdependence, taking cooperative and competitive styles as criterion variables. However, only the vertical types of each pattern interacted with goal interdependence, suggesting that the effect of VC on cooperation increased when high levels of goal interdependence are present. As the association between team and personal goals is reinforced and cooperative strategies fulfil both goals, high VC individuals seem to cooperate more with high levels of goal interdependence.

However, contrary to our expectations, an interaction was observed between VI and goal interdependence at time 2. The effect of VI on competition increased when goal interdependence moved from low to high values. While this result appears to disprove hypothesis 6, it is in line with theories explaining the joint use of cooperative and competitive behaviours in high interdependence contexts (Van de Vliert, 1999) and reinforces the argument that associates goal interdependence with competitive behaviour through the activation of an individualization process. Although goal interdependence did not have a main effect on the competitive style, it moderated the relationship between VI and competition. It may be that this individualization process takes longer to manifest itself than was initially expected. However, the interaction between

Table 3
Results of the multilevel analyses taking competition as criterion variable (p-Values based in two-tailed *z* distributions and deviance estimations based on -2*log-likelihood algorithm of Iterative Generalized Least Squares –IGLS–

	TIME 1 (MODELS)				TIME 2 (MODELS)			
	0	**1**	**2**	**3**	**0**	**1**	**2**	**3**
Grand Mean (β_{0j})	**3.858 (.053)**	**4.079 (.145)**	**4.083 (.144)**	**4.068 (.143)**	**3.884 (.056)**	**3.879 (.049)**	**3.877 (.050)**	**3.891 (.050)**
Individual Level Characteristics								
Age		-.118 (.077)	-.119* (.077)	-.106 (.070)		-.001 (.003)	-.001 (.003)	-.002 (.003)
Job Tenure		.044 (.072)	.041 (.072)	.033 (.071)		.001 (.002)	.002 (.002)	.002 (.002)
Cultural Patterns								
Horizontal Collectivism (HC)		.119 (.089)	.087 (.094)	.105 (.094)		.057 (.09)	.080 (.090)	.043 (.091)
Vertical Collectivism (VC)		.036 (.051)	.034 (.051)	.008 (.051)		.013 (.078)	.030 (.078)	.050 (.078)
Horizontal Individualism (HI)		.157* (.036)	.156* (.036)	.157** (.036)		.213**(.046)	.213** (.046)	.209** (.045)
Vertical Individualism (VI)		.270** (.051)	.261** (.052)	.261** (.053)		.182* (.055)	.185* (.055)	.181* (.054)
Goal Interdependence			.059 (.055)	.064 (.056)			-.077 (.051)	-.078 (.051)
Interaction Terms								
HC * G-I				-.008 (.098)				-.152 (.089)
VC * G-I				-.080 (.047)				-.022 (.073)
HI * G-I				-.072 (.038)				-.062 (.043)
VI * G-I				.078 (.056)				.122* (.054)
Variance Components								
Individual level	.600 (.058)	.478 (.057)	.475 (.046)	.458 (.044)	.555 (.054)	.474 (.046)	.467 (.045)	.452 (.044)
Group level	.004 (.019)	.000 (.000)[a]	.000 (.000)	.000 (.000)	.029 (.026)	.006 (.018)	.008 (.018)	.005 (.017)
Model Fit								
Deviance (D)	541.603	451.427	450.285	442.355	556.980	510.948	508.670	499.163
Δ model 0 (ΔD)		90.176**				46.032**		
Δ model 1 (ΔD)			1.142				2.278	
Δ model 2 (ΔD)				7.930				9.507*
Δ df		6	1	4		6	1	4
Individual level R^2		20.33%	0,62%	3,58%		14.59%	1.47%	3.21%
Group Level R^2		.000	.000	4,34%		79.31%	33.33%	37.5%
Intraclass correlation (p)	.0066	.000	.000	.000	.0496	.0125	.0168	.0109

* p<.05; ** p<.01; a, zero values are displayed when small amount of variance is present.

VI and goal interdependence suggests that this process may have started, though it is still in its initial stages. The sense of individual commitment activated by the individualization process is strongly perceived by VIs, so when goal interdependence is high it should be easier for team members to pursue personal and team goals simultaneously, and cooperative and competitive styles can be used in combination without threatening the team's goals. Thus, high levels of goal interdependence increase both cooperation and competition due to its moderating effect on the relationships between VC and cooperation and between VI and competition.

Some weaknesses of the present study should be mentioned. First, group level variance components showed high standard errors, which compels us to be cautious when interpreting the percentage of the reduction in this variance, especially in models taking competition as criterion variable. Second, the cross-validation of the current findings with larger samples is recommendable as the small number of second level units did not allow us to search for random relationships (slopes) across teams. Third, the mainly male composed sample did not allow controlling for sex differences in conflict managing styles.

In conclusion, cultural patterns and goal interdependence have showed an important effect on conflict management styles. Goal interdependence is a fundamental aspect in teams, and interacts with vertical types of collectivism and individualism. Value orientation in teams plays a clear role in predicting conflict management styles in teams and, in parallel, teams tend to highlight the importance of both individuals and groups inside the organization, favouring the joint use of both competitive and cooperative conflict managing styles.

In the light of these results, future research should focus on the associations between different types of conflicts and the changing conception of cooperation in team-based working organizations. Moreover, though the longitudinal nature of this study improves on other well-known models based on cross-sectional designs, the individualization process apparently activated by team-based work in organizations may need a longer period of analysis.

This study contributes to work and organizational psychology literature in at least three ways. First, it analyses real work teams in real organizations. Second, it expands on the scarce evidence on the interactive effects between cultural patterns and goal interdependence on conflict management styles from an intra-organizational perspective. And third, it extends research from a longitudinal and multilevel perspective, which will help to further our understanding of teamwork dynamics.

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