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Management Control System Use and Team Commitment

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MANAGEMENT CONTROL SYSTEM USE AND TEAM

COMMITMENT

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Abstract

Organizations are adopting teams' structures to react to competition and enhance performance, but they do not fully achieve these objectives. Psychology literature argues that one of the main reasons for that is the lack of team commitment, which could be enhanced partially for the social identity of the team. Accounting literature argues that management control systems can be used as mechanism to motivate individuals in teams, and so enhance commitment. Using an experiment conducted among 120 post-graduate students, we test how team social identity and the interactive and diagnostic uses of the management control systems influence commitment to team's objectives. Results generally support our hypotheses. Our findings show that an interactive use of management controls in teams is positively related to high level of teams' commitment. Moreover, our results also support that the effect of social identity on teams' commitment is moderated by the level of interactive use of management control systems in teams.

Keywords: Teams, Use of Management Control Systems, Social identity, Commitment, Experiments

MANAGEMENT CONTROL SYSTEM USE AND TEAM COMMITMENT

1. Introduction

Organizations are adopting teams' structures to be more efficient, to enhance flexibility and innovativeness, and to generate diverse and rich knowledge (Van Dick, Tissington & Hertel, 2009). However, many types of teams are notoriously unstable and fail to achieve their objectives, because of teams members have different interests (Rowe, Birnberg & Shields, 2008; Coletti, Sedatole & Towry, 2005). Psychological researches argue that one of the main reasons for that is the lack of team commitment, which could be enhanced partially for the social identity of the team (see, Ellemers, De Gilder & Haslam, 2004; Katzenbach & Smith, 1993). These researches suggest that organizations should adopt a social identity approach to manage teams, because this approach helps to understand the psychological processes related to commitment (Haslam et al, 2006). One of the questions to Management researches is what practices can be used to enhance commitment of individuals to teams' objective (Vosselman & Van der Meer-Kooistra, 2009). Management Control Systems (MCS) are routines and procedures to maintain or alter patterns in organizational activity (Simons, 1990) and, also, in teams. In this sense, recent researches have analyzed the relation between MCS and motivation problems in teams (Román, 2009; Libby & Thorne, 2009) using economic approach, such as agent theory, social dilemma situation or goal interdependence theory. However, despite the self-interest assumption of the economic behavior models, evidence indicates that individuals' behavior respond to ethical and moral principles rather than to economic incentives (Sprinkle, 2003). In this sense, it is necessary to integrate psychological and economics approach (Sprinkle, 2003).

Psychological research has emphasized the importance of commitment in work group to embrace team objectives, to motivate individuals' effort toward these objectives, and to impact in team performance (e.g. Den Hartog & Belschak, 2007; Ellemers, De Gilder & Haslam, 2004; Vandenberghe, Bentein & Stinglhabmer, 2004). These researches differentiate two concepts relate to individuals' behavior, a cognitive and an affective concept. Commitment is an affective concept, and reflects general affect, and also emotional attachment and involvement with someone or something (Den Hartog & Belschak, 2007). Social identity is a cognitive concept, where an individual analyzes his social context and interpret this context, and thus, changes his behavior adapting to this context (Van Knippenberg, 2000). Psychological researches suggest that a social identity approach in teams can explain the psychological process to alter team commitment (Ellemers, De Gilder & Haslam, 2004). In this sense, organizations should adapt this social identity approach to maintain or enhance team commitment (Haslam et al, 2006).

Management literature has extensively analyzed the relation between management control systems (MCS) and teams, (e.g., Román, 2009; Rowe, Birnberg & Shields, 2008; Coletti, Sedatole & Towry, 2005). Most of these researches use an economic approach to analyze how incentives motivate individuals, but analyzing individuals as separate entities, and forgetting the group as unit of analysis (Ellemers, De Gilder and Haslam, 2004). However, organizations can change individuals' behavior with other practices and affect group behavior (Lembke & Wilson, 1988). Recent researches (see, Román, 2009; Rowe, Birnberg & Shields, 2008) suggest that organizational initiatives such as reporting information and communication between workers are more effective motivators than the effect generated by monetary incentives alone. The reason is that the relation between

teams' processes (eg. the use of MCS) and teams' output is mediated or moderated by psychological variables (Somech, Desivilya & Lidogoster, 2009).

Our paper shows that psychological factors, specifically social identity, affect the cognitive behaviour of individuals in a team, and play an important role in enhance or maintain commitment to the teams' objective. Moreover, our research proposes that a different use of MCS can affect the affective behavior of the individual's in a team, to commit with the common objectives. We focus on the socialization process of the management practices, we use Simons' (1995) description of opposite uses of MCS: diagnostic and interactive, where an interactive use involves regular and frequent communication between individuals (Bisbe, Batista-Foguet & Chenhall, 2007). Psychological researches (e.g. Cohen, Wildschut & Insko, 2010; Dawes, Van de Kragt & Orbell, 1988) suggest that communication among members of a team, activate different norms that can change individual's behavior. This communication causes relationships between individuals are closer and easier to understand (Hogg & Terry, 2000). If individuals feel closer, they can develop affect and involvement with other members, and change their reference point of profit, considering team objective more important (Sutter & Strassmair, 2009). Therefore, our paper proposes that an interactive use of MCS in teams, characterized by regular and frequent communication, can enhance commitment to teams' objective.

To test our hypotheses, we conducted an experiment, with 120 postgraduate students at Pablo Olavide University at Seville. We designed a 2 x 2 experiment (Use of MCS x Social Identity), with one dependent variable, team' commitment. Students were joined in teams of three members, with a common goal: to invest in the project of the construction of a Childcare Center in the city of Seville. The experiment had three phases.

At each phase groups were presented with more negative information about the progress of the Childcare Center. After each phase, teams should, decide the level of investment on the project. In the last phase, individuals answered some questionnaires about multiple aspects of social identity, interactive use of MCS, and commitment in teams. The results generally support our hypotheses. Our findings show that an interactive use of MCS in teams is positive related to high level of teams' commitment. Moreover, our results also support that the effect of social identity on teams' commitment is moderated by the level of interactive use of MCS in teams.

Our research contributes to the literature in some ways. First, our paper answers calls for research to adopt a “behavioral-economics” approach, whereby concepts from economics and psychology are integrated (Sprinkle, 2003), Thus we demonstrate that psychological factors (as social identity), rather than economics factors, play a more important role in motivating individuals in teams. Secondly, our research contributes to the extent literature of Simons' “levers of control” in two ways. On one hand, it is the first experimental work where authors manipulate the use of MCS. On the other hand, we demonstrate that the regular and frequent communication of an interactive use of MCS can alter psychological factors of individuals, so as to influence individuals' affective behavior in teams. Finally, our papers introduce the analysis of the effect of MCS in a psychological variable, as affective team commitment. This variable is a better predictor of behavior relevant to the team than others types of organizational commitment (Vandenberghe, Bentein & Stinglhamber, 2004).

The remainder of this paper is organized as follows. In the next section, we review the relevant literature and develop our hypotheses. Third section describes the experiment that we used to test the hypotheses. Fourth section presents the results from the experiment.

Final section contains a discussion of the results, conclusions, limitations and suggestions for future work in this area.

2. Background and Hypotheses Development

2.1. *Social identity Theory*

Social Identity Theory (SIT) argues that the potential of a team depends not only on the skill, knowledge and ability of the people in the team, but also on their ability and motivation to feel the team as a unit (Lembke & Wilson, 1998; Tajfel & Turner, 1986). SIT assumes two important sets of ideas (Tajfel, 1978). On one hand, individual behavior could be represented in terms of a bipolar continuum, at one extreme it is interpersonal behavior (character and motivations of the individual as an individual), and in the other extreme it is intergroup behavior (behavior derives solely from the person's group membership). In the other hand, individual behavior is a consequence of interplay between social and psychological factors. Social factors have to do with the objective features of the world that an individual confronts and psychological factors are associated with the individual's interpretation of that world. Individuals have different social identities (for example, as a team member, or a family member), but not all of these social identities are salient at a time (Van Knippenbeg, 2000). Although identification itself may contribute to social identity salience, contextual factors affect salience as well. Social identity is not an automatic process that occurs between the personal and social identity, or between an individual's social identities (Hogg & Terry, 2000), but depends on how individuals interpret the social context in which they operate or work (Rowe, Birnberg & Shields, 2008). It is important to note that social identity will influence behavior only when is

salient, or cognitively activated (Van Knippenberg, 2000), which means that a person must be cognitively aware of belonging to a certain group.

2.2. The use of Management Control Systems

Management control systems are defined broadly as the formalized routines and procedures that use information to maintain or alter patterns in organizational activity (Simons, 1990) and by extension in a team. Simons (1991) emphasizes the relevance of the style of use of control systems, distinguishing two styles: diagnostic and interactive control systems. Diagnostic use represents the traditional feedback role as MCS used on an exception basis to monitor and reward the achievement of pre-established goals. Diagnostic use is associated with highly structured channels of communication and restricted flow of information (Henri, 2006). Diagnostic use undercuts the commitment of organizational actors, by reinforcing the existing lines of authority and responsibility (Abernethy & Brownell, 1999). By contrast, interactive use is associated with intensity use and intensity communication (Henri, 2006). Bisbe, Batista-Foguet & Chenhall (2007) identify five properties of interactive use of MCS: an intensive use by top management; an intensive use by operating management; regularly and frequently meet and interact resulting in face-to-face challenge and debate; information relates to strategic uncertainties; and a non-invasive, facilitating and inspirational involvement. Moreover, these authors point that changes in any of these properties may be expected to produce changes in the level of interactivity of the control system (Bisbe, Batista-Foguet & Chenhall, 2007). So, changes in one dimension may result in changes in the level of interactivity even though the other dimensions remain constant.

In this paper, we use the property of regular and frequent communication between individuals to differentiate an interactive and diagnostic use of MCS in teams. Management researches (e.g. Naranjo-Gil & Hartmann, 2007; Widener, 2007; Henri, 2006) identified frequent interaction and communication as one of the most important features of an interactive use of MCS. Moreover, although the traditional interpretation is that the interactive use reflects interaction between different hierarchical levels, Naranjo-Gil & Hartmann (2007) suggest that the interactive use may also reflect the use of MCS at a certain level (as a team).

2.3. Hypotheses

Social Identity and Team' Commitment

In this paper we analyze the relation between social identity of the team, and the level of team' commitment, following the work of Haslam et al (2006). The social identity process implies a cognitive change in individual behaviour. If individuals of a team define themselves in terms of their group membership, these individuals ascribe characteristics that are typical of the group and psychologically the group becomes part of the individual (Van Knippenberg, 2000). The more one conceives of oneself in terms of one's membership in a group (e.g., social identity or team identity), the more likely one is to act in accordance with the group's beliefs, norms and values, and generally to act in "group typical" ways. Moreover, if the individual defined in collective terms (e.g. social identity) rather than individual terms (individual identity), the group represents an intrinsic not extrinsic source of motivation (Ellemers, De Gilder & Haslam, 2004). In this case, this intrinsic motivation affects the commitment of individuals to team' objective, as individuals considered more important objectives of their group than individual objectives.

Therefore, when an individual has a social identity salient in the team (“in-group”), there is a cognitive process that causes it to act in accordance with the group’s beliefs, norms and values (Hogg & Terry, 2000). This individual think in terms of "we" and use their efforts to achieve goals’ team itself above other objectives, and therefore choose higher levels of commitment to the common objectives. By contrast, if an individual work in a team where the context activates his individual behavior or others social identity (“out-group”), he will act in accordance with his beliefs, norms and values, developing his personal identity or acting in accordance with beliefs or interests of another group (“out-group”) (Hogg & Terry, 2000). These individuals are not motivated to develop higher levels of effort on the team, reducing levels of commitment within the team. Following this reasoning, we formulate the following hypotheses:

H1: Team’ commitment will be more influenced by high team social identity than by low team social identity.

Interactive Use of Management Control Systems and Team’ Commitment

We focus on the characteristic of a regular and frequent communication to differentiate an interactive and diagnostic use of MCS between members of a team. We analyze how this regular and frequent communication of an interactive use of MCS can change individuals’ behavior in a team. The regular communication allows individuals to exchange information about the task, risks and uncertainties, and, also, allows individuals to know the abilities and intentions of other individuals. Regular communication actives norms of fairness and trust between individuals (Cohen, Wildschut & Insko, 2010). The exchange of information encourages individuals to expect that others’ intentions are benign, and, allows individuals

to feel near other members (Vosselman & Van der Meer-Kooistra, 2009). If individuals can debate and discuss information about the project, they can feel accountable of this project and develop an affective commitment to it (Den Hartog & Belschak, 2007). The frequent interactions between individuals in a team facilitate that members feel their work is important to the project (Katzenbach & Smith, 1993). Moreover, frequent communication allows members to reach a compromise with the project (Abernethy & Brownell, 1999), feeling an affective involvement to them.

By contrast, we characterized a diagnostic use of MCS by restricted flows of information and communication between individuals in a team (Henri, 2006). This restricted communication represents the traditional feedback role as MCS used on an exception basis to monitor and reward the achievement of pre-established goals, reinforcing the existing lines of authority and responsibility (Abernethy & Brownell, 1999). If individuals don't have regular and frequent communication between them, they don't know the intentions of the others members. In this sense, it is difficult to feel accountable of the objective of the team, without communication and contact between them (Den Hartog & Belschak, 2007). Following this reasoning, we propose the following hypothesis:

H2: Team' commitment will be more influenced by an interactive use of MCS than by a diagnostic use of MCS.

Interactive Use of Management Control Systems, Social Identity and Team' Commitment

The last hypothesis of our work proposes that the interactive use of MCS in teams influences the impact of social identity on team' commitment. Ellemers, De Gilder &

Haslam (2004) suggest that a social identity approach helps to understand the psychological process related to commitment because this approach explains changes in the cognitive process of the individual. These cognitive changes allow individuals to identify themselves in collective terms, and influence team commitment. But, social identity process is not an automatic process. This process needs that social and psychological factors change (Haslam, 2001). Social factors means that the context changes through an intergroup context (e.g. there are not physical barriers between members of the group). Second, psychological factors imply that individuals interpret this intergroup context, and adapt their cognitive behavior to the group. In this sense, an interactive use of MCS, characterized by frequent and regular communication and interaction between members, can be interpreted as a social factor. This frequent communication can break functional and hierarchical barriers (Henri, 2006), involving close working relations (Bisbe & Otley, 2004) between members. In this sense, Rowe, Birnberg & Shields (2008) demonstrated that a control system that facilitates communication between members involves framing or reframing boundaries and influence individuals' behavior to more cooperative. Thus, the interactive use of MCS implies a supportive context that facilitates the impact of social identity on team commitment. However, a diagnostic use of MCS is characterized by structured channels of communication and restricted flows of information between members of a team (Henri, 2006). In this sense, the diagnostic use reinforces the existing lines between members. This process of restricted communication doesn't affect social factors in the team. If there are not changes in the context of the team, individuals perceive fewer signals to change their behavior. Following this reasoning, our work proposes that regular and frequent

communication of the interactive use of MCS influences the impact of social identity on team' commitment.

H3: The impact of team social identity in team' commitment will be more influenced by an interactive use of MCS than by a diagnostic use of MCS.

3. Experimental method

To examine the hypotheses we conducted an experiment 2 x 2 between subjects (Use of MCS x Social Identity) with teams of three individuals. The key characteristics of an experiment are the manipulation of the independent variable, the systematic assessment of the dependent variables, and the control of other possible contaminating factors. The advantage is that researchers can make inferences about the causal relationships linking variables (Forsyth, 1999). Moreover, experiments are a particularly useful vehicle for studying whether and how management control system practices affect the behavior of individuals within an organization or team, because the investigator control the research setting and isolate the effects of variables that are confounded in the natural environment (Sprinkle, 2003).

We have two independent variables (Use of MCS and Social Identity) and one dependent variable (Team Commitment). The use of MCS was divided in two conditions: interactive use vs. diagnostic use. And the social identity was divided in two conditions: high social identity vs. low social identity. We had four experimental conditions. The experiment allowed us to investigate the effect of an interactive vs. diagnostic use of MCS in the level of team commitment, and the effect of a high social identity vs. low social

identity on team commitment. Moreover, the experiment allowed us to investigate the interaction between both independent variables (Use of MCS and Social Identity).

Our research paradigm is modelled closely following the work by Haslam et al (2006), that has examined the link between social identity and commitment to group project. These authors design a 2x1 experiment (Social identity vs Individual identity), where groups of three or four students were required to reflect upon plans for a Childcare center being built in a town center. The work of Haslam et al (2006) is appropriated to contrast our model for two reasons. First, authors created the condition of social identity vs. individual identity, manipulating both. Second, these authors manipulated the intra-team communication between members at three different phases. Members of the team debate and discuss information about the project, during 10 minutes, before deciding their level of commitment. In our model, we add two conditions relate to the use of the MCS. We differentiated an interactive use of MCS through a diagnostic use, by the regularly and frequently meet and interact, between members to debate and discuss information (Bisbe, Batista-Foguet & Chenhall, 2007). So, in our experiment we add a control condition, which is the diagnostic use of MCS. We manipulated the condition of interactive use of MCS allowing teams having regular and frequent communication between members (10 minutes to debate and discuss information about the project, in each phase). Whereas the condition of diagnostic use of MCS represents teams without regular and frequent communication between members (they only have 1 ½ minutes).

Participants, design and procedure¹:

The participants in our experiment were 120 postgraduate students from Pablo de Olavide University at Seville (no specific knowledge or skills were required to participate in the

¹ In Appendix A we describe with more detail the process of the experimental task for one session.

experiment). We formed 40 teams (10 teams for each condition) of 3 students (total: 120 individuals). The age of the participants ranges from 22 to 53, with a mean of 27.75 years. The 43.33% were male, and the 56.67% were female. Five euros incentive was used as a show up fee. Moreover, a lottery of 200 euros was drawn among all the participants. Participation in the experiment took about 45 minutes on average.

The experimental tasks for each group consisted of selecting the level of investment in the construction of a Childcare Center in the city of Seville. The study had three temporal phases. At each phase groups were presented with information about the progress of the center. At each phase, they are given more negative information than the previous phase, in order to analyze changes in the level of commitment of the teams. After each phase, each team, through its members, should decide the level of investment on the project (300.000 € are available for each team). The dependent variable (team commitment) was measured with two other variables, financial commitment, measured by the level of money committed to the project. And the affective commitment, measured with a questionnaire at the end of the experiment (Haslam et al, 2006) (see Appendix B).

The experiment was programmed in z-Tree (Fischbacher, 2007) in a laboratory. Each session ran in two working rooms: Groups' room and Experimental room. Groups' room is composed of working tables (three seats per table). In this room each team were placed in a working table, and received the package of information about a proposed Childcare center. After reading during five minutes this information, participants went into the Experiments' room and took place in separate and individual cubicles, where each one responded in his computer to the questionnaires. Each phase started on Groups' room and finished on Experiments' room. The experiment finished in the third phase in Experiments' room.

Manipulation and measures

The social identity variable was manipulated by combining two procedures that have been used in previous works. Colour groups were used to manipulate high social identity (Towry, 2003). The use of colour increased the salience of colour groups, facilitating the participants' self-categorizations into these groups. The presence of two colour groups promotes this process as prior research has shown that a social identity may be clarified by in-group/out-group comparisons (Abrams & Hogg, 1990). Moreover, participants assigned to high social identity condition were asked to generate a codename for their group (that reflects their group common perspective on the issue of community Childcare center) and to write on their response questionnaires (Haslam et al, 2006). In contrast, participants assigned to low social identity were not asked to generate a codename for their group.

To manipulate the use of MCS we only used one of its properties. As Bisbe, Batista-Foguet & Chenhall (2007) suggest, changes in one dimension or property may result in changes in the construct of use of MCS, even though the other properties remain constant. We manipulated the property of regular and frequent communication between members. In the condition of interactive use of MCS teams received new information about the project in face-to-face meetings, and they were allowed to discuss and debate this information for 10 minutes, in each phase. In the condition of diagnostic use of MCS, teams also received the same information in face to face meetings, but they were allowed to analyze this information together for 1 ½ minutes. It should be noted that difference between interactive and diagnostic use, was the regular and frequent communication between members, not face to face meetings.

Dependent variable (team commitment) was measured by two dimensions. First, the level of money committed to the project (a financial commitment), and it is measured

after each phase. And second, the level of affective commitment to the team project (is measured by a questionnaire modelled by Haslam et al (2006), see Appendix B). This questionnaire was measured at the end of the experiment. It is important to note that each member made his decision individually (the group did not need to agree on the decision), because our paper analyzed a motivation problem not a decision-making problem. Moreover, at the end of the experiment, participants had to answer two more questionnaires (see Appendix C and D). One about social identity aspects, to analyze the evolution of social identity level of teams, in each condition (see, Haslam et al, 2006). And other relate to the interactive use of MCS (therefore, only teams in interactive use condition could respond it). This allowed us to identify whether differences in the level of interactivity can explain differences in varying team commitment level reached by the teams.

4. Results

Data acquired through the manipulation check questionnaire shows that participants had a good understanding of the procedures and that the manipulation were successful. Table 1 provided descriptive statistics of the 4 conditions (high social identity- interactive use of MCS, high social identity- diagnostic use of MCS, low social identity- interactive use of MCS, low social identity- diagnostic use of MCS), for the dependent variable: financial commitment and affective commitment. For financial commitment we used the level chose by the groups in the last Phase of the experiment, and for affective commitment we used the mean of the four items of the questionnaire (factor analysis indicated that this four items loaded on one factor).

Table 1: Descriptive Statistics. N=40

		High Social Identity				Low Social Identity				Total			
Interactive use	Financial Commitment	N=10 Min.	Max	Mean	SD.	N=10 Min.	Max	Mean	SD.	N=20 Min.	Max	Mean	SD.
	Affective Commitment	60.000	360.000	208.000	1,37986E5	60.000	360.000	232.000	1,12032E5	60.000	360.000	220.000	1,22946E5
Diagnostic use	Financial Commitment	N=10 Min.	Max	Mean	SD.	N=10 Min.	Max	Mean	SD.	N=20 Min.	Max	Mean	SD.
	Affective Commitment	2,50	4,42	3,76	,70541	2,83	4,75	3,93	,70580	2,50	4,75	3,85	,69263
TOTAL	Financial Commitment	N=20 Min.	Max	Mean	SD.	N=20 Min.	Max	Mean	SD.	N=40 Min.	Max	Mean	SD.
	Affective Commitment	60.000	360.000	202.000	1,26298E5	60.000	360.000	226.000	1,11176E5	60.000	360.000	214.000	1,16456E5
		1,83	4,58	3,46	,87511	2,67	4,25	3,53	,50468	1,83	4,58	3,49	,6964
		N=20 Min.	Max	Mean	SD.	N=20 Min.	Max	Mean	SD.	N=40 Min.	Max	Mean	SD.
		60.000	360.000	205.000	1,28780E5	60.000	360.000	229.000	1,08671E5	60.000	360.000	217.000	1,18239E5
		1,83	4,58	3,61	,78876	2,67	4,75	3,73	,63285	1,83	4,75	3,67	,70849

In order to test our hypotheses we used a 2x2 analysis of variance (ANOVA), because ANOVA analysis allows contrasting the direct and interactive effects of two or more independent variables simultaneously. The equation used was the following:

$$X_{ij} = u + A_i + B_j + AB_{ij} + e_{ij}$$

Where:

X= team commitment

u=intercept

A=Groups with member with high social or low social identity

B=Groups with interactive or diagnostic use of MCS

E=error

Regarding our three hypotheses, the results indicate (see Table 2) that there are not significant differences in both dependent variables (financial commitment and affective commitment) among the 4 conditions.

Table 2: ANOVA

Dependent Variables		Sum of Squares	Df	Mean Square	F	Sig.
Financial Commitment	Between Groups	6,120E9	3	2,040E9	,136	,938
	Withing Groups	5,391E11	36	1,498E10		
	Total	5,452E11	39			
Affective Commitment	Between Groups	1,430	3	,477	,945	,429
	Within Groups	18,147	36	,504		
	Total	19,576	39			

To extend previous results, we made a new analysis of our data using the two questionnaires of social identity and interactive use of MCS. We noted Haslam et al (2006) demonstrated that social identity influence team commitment, but in this work all groups made an interactive use of MCS. So, we made an analysis using the 20 groups that had made an interactive use of MCS (not diagnostic). In this case, we have results for two dependent variables of team commitment (financial commitment and affective commitment) and two independents variables (social identity and interactive use of MCS). These two independents variables were measured through the four items of their questionnaire, measured at the end of the experiment. We made a factorial analysis of the two constructs (social identity and interactive use of MCS). The four items of social identity loaded on one factor, but only three items loaded on the interactive MCS use factor (the remaining item was excluded for our analysis).

We wanted to contrast if there were an interaction between the level of interactive use of MCS and the level of social identity of the team. We calculated the mean of the independents variables social identity and interactive use of MCS. After, we reordered the cases in function its value to overcome or not these means. We obtained 4 new conditions: high social identity- high interactive use of MCS, high social identity – low interactive use of MCS, low social identity- high interactive use of MCS, low social identity- low interactive use of MCS.

In order to test the hypotheses of the interaction between the two independent variables we used again a 2x2 analysis of variance (ANOVA). The equation used was the following:

$$X_{ij} = u + A_i + B_j + AB_{ij} + e_{ij}$$

Where:

X= team commitment

u=intercept

A=Groups with member with high and low social identity

B=Groups with high and low interactive use of MCS

E=error

The results of Table 3 indicate that there are significant differences in one dependent variable (affective commitment) among the 4 conditions. In this case, both the level of social identity and the level of interactive use of MCS ($p < 0.01$) have significant influences on affective commitment, but not in financial commitment.

Table 3: ANOVA

		Sum of Squares	Df	Mean Square	F	Sig.
Affective Commitment	Between Groups	6,909	3	2,303	16,703	,000
	Within Groups	2,206	16	,138		
	Total	9,115	19			
Financial Commitment	Between Groups	6,304E10	3	2,101E10	1,500	,253
	Within Groups	2,242E11	16	1,401E10		
	Total	2,872E11	19			

As we only found differences between the four conditions for the dependent variable of affective commitment, we made an analysis of a General Linear Model, where the affective commitment was the dependent variable, and the social identity and the

interactive use of MCS the independent variables. Table 4 shows that the interaction between the two dependent variables was significant ($p < 0,05$).

Table 4: Tests of Between-Subjects Effects.

Dependent Variable: Affective Commitment

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	6,909 ^a	3	2,303	16,703	,000
Intercept	299,697	1	299,697	2173,685	,000
Interactive Use of MCS	2,319	1	2,319	16,823	,001
Social Identity of the team	1,633	1	1,633	11,844	,003
Interactive Use of MCS * Social Identity of the team	1,519	1	1,519	11,018	,004
Error	2,206	16	,138		
Total	304,924	20			
Corrected Total	9,115	19			

a. R Squared = ,758 (Adjusted R Squared = ,713)

5. Discussion and conclusion

This work had three objectives. The first one was to explore how social identity influences team commitment. The second was to explore if a different use of MCS (interactive vs. diagnostic) can affect the affective behavior of individual's in the team, and influence team commitment. Finally, our work proposed that there is an interaction between the use of

MCS and the social identity of the team. Our empirical results did not support our hypotheses. We develop some explanations. Relate to the first hypothesis (the relation of team commitment with high social vs low social identity), we think the manipulation of low social identity condition was not sufficient to separate through a social identity condition. The three individuals of each team in low social identity condition were seated in the same table. The three individuals read the information at the same time near everyone. They have contacted in each phase, and they have some time to debate in each phase. We think there are more aspects that reinforce some level of team social identity (in-group) than other social identity (out-group) or individual identity. Regarding our second hypothesis (the relation of team commitment with interactive vs. diagnostic use of MCS), we think the manipulation of diagnostic use of MCS it was more near a low interactive use of MCS under that a diagnostic use of MCS. Finally, about the third hypothesis, our results didn't support the interaction between the use of MCS and the social identity of the team. We find one possible explanation. In our work there are groups that debate for 10 minutes, and groups that debate only for 1 ½ minutes. In Haslam et al (2006) the process of identification was supported by an interactive use of MCS (all groups debate 10 minutes) and it is this interactive use (not only the process of social identification) what interact with the level of social identity of the team and influence the impact of social identity in team commitment.

In contrast to these results, our second analysis demonstrated three relations. The main difference of this new analysis regarding the original hypotheses it is that the variables social identity and use of MCS have not been considered dichotomic variables. In other way, we have differentiated levels of social identity and even of interactive use of MCS. Results of this second analysis demonstrate that the influence of social identity on

team commitment is significance if we compare levels of social identity. Moreover the influence of the use of MCS on team commitment is significance if we compare levels of interactive use of MCS. Finally, our work demonstrates that the frequent and regular communication of an interactive use of MCS interact with social identity of the team, and influence the impact of social identity in team commitment.

Our findings have implications for management practices. First, we demonstrate that organizations can alter individuals' behavior developing team social identity. Thus, psychological and social factors are more important than economic factors (such as sanctioning or incentives) to resolve motivation problems in several teams (Sprinkle, 2003; Towry, 2003). But team social identity it is not an automatic and easy process. And our findings demonstrate that managers can use others routines and practices, as management control systems to affect individuals' behavior. An interactive use of MCS, characterized by frequent and regular communication, can be used to influence individuals' behavior and to improve the level of team commitment. Moreover, this interactive use of MCS can change social context in the team. If individuals in a team have some level of identification and they interpret changes in their social factor (e.g. trough a high interactive use of MCS), the impact of this social identity on team commitment is higher.

This paper contributes to the literature in two ways. First, our work can help to the confuse results of management control systems and teams, because we use a "behavioral-economics" approach, whereby concepts from economics and psychology are integrated (Coletti, Sedatole & Towry, 2005; Towry, 2003). Research that use only one of this approach are partly valid, because individuals respond to ethical and moral principles rather than to economic incentives (Sprinkle, 2003). Second, our work is the first experimental work where the use of MCS is manipulated. Following the results of Bisbe,

Batista-Foguet & Chenhall (2007) we propose that the interactive MCS should be modelled as a multidimensional construct. And experiments involve control over measurement. This should lead to a high degree of specificity in the operational definition of variables and precise and objective variable measures (Sprinkle, 2003).

Our work also has limitations. On one hand, we have focused on the property of regular and frequent communication of an interactive use of MCS, and we have analyzed his impact on team commitment. Our work suggests that managers can alter the use of the MCS to act as a motivational factor in teams. However, the interactive use of MCS is defined by five properties with distinct natures (Bisbe, Batista-Foguet & Chenhall, 2007). For instance, intensive use refers to frequency, while non-invasive involvements refer to leadership styles. What interactive style property can have a major impact on commitment or performance? Further experimental researches are needed to analyze the impact of different properties of use of MCS in individuals' behavior. On the second hand, our work has analyzed the impact of different uses of MCS on team affective commitment, a psychological variable. Psychological researches suggest the importance of affective commitment in work group to embrace team objectives, to motivate individuals' effort toward these objectives, and to impact in team performance. But we did not analyze these relations. Future researches are needed to analyze the impact of psychological variables, as team affective commitment, in individuals' effort, team cooperation or team performance.

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APPENDIX A: Experimental procedures

We explain the experimental procedures for the first session (Condition 1: High Social identity x Interactive use of MCS). The experiment started in the Groups' room. As participants arrived, they were randomly assigned to five groups (of three members) with each group identified by a different colour (T-shirts with the same colour were given to individuals of the same team). Each team were placed in a working table, and the experimenter explained that the study is an activity of decisions relating to a hypothetical public work project – the Childcare center- and the study proceeded over a three temporal phases. The experimenter explained that each team represents a group of individuals interested in the project and they should decide how much money the team would invest. In each phase they received different and new information about the project, so in each phase they should decide again how much to invest. After, the experimenter asked to the groups to decide a codename for their group (because they were in the high social identity condition).

In phase I, the experimenter gave a package of information about the proposed Childcare center. The package contained very positive information about the project (project plans, location on a city map of Seville, timing and budget of the project, community need for the project, and information that the center had been approved by the Council). In light of this information, teams were asked to discuss and debate this information for 10 minutes (because they are in interactive use condition). At the end of that time, participants went into the Experiments' room and took place in separate cubicles. Each participant responded individually, in his computer, the level of investment to be made by the group in the project on a scale marked in 60.000 € increments (maximum:

300.000 €). In order to reinforce the manipulation of social identity salience, participants in high social identity condition wrote the codename of the group in their questionnaires (if participants are in low social identity condition, they wrote their personal names).

In phase II, individuals went again into the Groups' room, and took place in their working tables. The experimenter gave another information package. This second package contained two positives pieces of information: newspaper article reporting a public ceremony to mark the beginning of construction of the center, and a letter from manager of the Construction Company with a positive timing report. But this package will also contain two pieces of negative information: a budget report with a 10% increase in total costs, and a letter from an environmental and ecological group, demanding an environmental impact study. Again, teams were asked to discuss and debate this information for 10 minutes. At the end of that time, participants went into the Experiments' room and took place in the same place than Phase I. Each individual in his computer should respond how much money his group should invest in the project.

In phase III, individuals went again into the Groups' room, and took place in their working tables, and the experimenter gave the last information package. This third package contained only one positive piece of positive information (the announcement of the official opening of part of the center) and a lot of negative information (news of contaminated material in the children's sandpit, timing of project is delaying, it is necessary expensive corrections to the center if it was to gain building approval, and a threat of Industrial Park workers not to take their children to the Childcare center). Again, teams were asked to discuss and debate this information for 10 minutes. At the end of that time, participants went into the Experiments' room and took place in the same place than Phase I and II.

Each individual responded again how much money they groups should invest in the project.

To finish the study, individuals in Experiments' room responded two questionnaires 2, relate with the level of social identity of each individual on his team, and the level of interactive use of MCS in the activity (therefore, only teams in interactive use condition can respond this last questionnaire). At the end, participants answered a questionnaire designed to check manipulations and to measure control variables (see Appendix E).

Then, the experiment continued with other sessions. The differences about the process described above for the other conditions are two. First, teams in low social identity didn't use colour groups to identify, and didn't write the codename of the group in their questionnaires (they wrote their personal names). Third, teams in diagnostic use of MCS weren't allowed to discuss and debate the information for 10 minutes. In this case, the experimenter gave the package of information to teams in Groups room, and after reading, they only debate for 1 ½ minute with other members.

APPENDIX B: Affective commitment questionnaire (phase III)

We adapt the instrument of Haslam et al (2006) using a 5-point scales, ranging from 1 (nothing) to 5 (totally):

- a) How sensible do you thing the original idea for the childcare center was? (good idea)
- b) How sensible is to proceed with the childcare center? (should proceed)

² Questionnaire about Social Identity is available in Appendix C, and questionnaire about Interactive use of MCS is available in Appendix D

- c) How likely is it that any problems with the childcare center can be overcome?
(problems temporary)
- d) How disappointed will the community be if the childcare center does not proceed?
(Community disappointed).

APPENDIX C: Social identity questionnaire (phase III)

We adapt the instrument of Haslam et al (2006) using a 5-point scales, ranging from 1 (nothing) to 5 (totally):

- a) I see myself as a member of my team (self-categorized).
- b) I am pleased to be a member of my team (pleased).
- c) I feel strong ties with other members of my team (tied).
- d) I identify with other members of my team (identified).

APPENDIX D: Interactive use of MCS questionnaire (phase III) (Only participants in Interactive use condition answer this questionnaire).

We adapt the instrument of Naranjo-Gil & Hartmann (2007) used for top management teams.

Using a 5-point scale, ranging from 1 (nothing) to 5 (totally), individual will indicate the extent to which he uses the MCS to:

- a) Set and negotiate goals and targets.
- b) Challenge new ideas and ways for doing tasks.
- c) Involvement in a permanent discussion with other members.
- d) Learning tool on this activity.

