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Title: Investigating the relationship between leader behaviours and group cohesion within women's walking groups

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Abstract: Early research has shown that leadership behaviour is viewed as a crucial factor in successfully developing team cohesion, effectively resulting in greater team satisfaction and more positive team outcomes. However, little is understood if these same factors have an impact on physical activity groups. **Objective:** The purpose of this study was to investigate the relationship between leader behaviours and group cohesiveness within women's physical activity groups. **Design:** Participants (N=95) included a sub-sample of adult women who were previously involved in a women's physical activity/walking program. **Methods:** Participants assessed their groups' leader behaviour using items pertaining to enthusiasm, motivation, instruction and availability, and their groups' cohesiveness using the Physical Activity Group Environment Questionnaire (PAGEQ). Canonical correlation analysis was used to determine the strength of association between the four concepts of group cohesion (ATG-T, ATG-S, GI-T & GI-S) and the four items pertaining to leadership behaviour. **Results:** A significant multivariate relationship was revealed between group cohesion and leadership behaviour, Wilks' $\lambda=0.43$, $F(16,170)=5.16$, $p<0.001$. The canonical correlation for this function was $RC=0.74$, indicating a strong relationship. Simply stated, group leaders who were perceived as being highly enthusiastic, who have a high ability to motivate, who have a high ability to provide personal instruction and who are available outside of the group's regular activities were associated with higher levels of group cohesion. **Conclusions:** Although a cause-effect relationship can not be determined, the current study can serve as a valuable template in guiding future research in examining potential mechanisms that may assist with physical activity sustainability.

**Investigating the relationship between leader behaviours and group cohesion
within women's walking groups**

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Abstract

Early research has shown that leadership behaviour is viewed as a crucial factor in successfully developing team cohesion, effectively resulting in greater team satisfaction and more positive team outcomes. However, little is understood if these same factors have an impact on physical activity groups. *Objective:* The purpose of this study was to investigate the relationship between leader behaviours and group cohesiveness within women’s physical activity groups. *Design:* Participants (N=95) included a sub-sample of adult women who were previously involved in a women’s physical activity/walking program. *Methods:* Participants assessed their groups’ leader behaviour using items pertaining to enthusiasm, motivation, instruction and availability, and their groups’ cohesiveness using the Physical Activity Group Environment Questionnaire (PAGEQ). Canonical correlation analysis was used to determine the strength of association between the four concepts of group cohesion (ATG-T, ATG-S, GI-T & GI-S) and the four items pertaining to leadership behaviour. *Results:* A significant multivariate relationship was revealed between group cohesion and leadership behaviour, Wilks’ lambda=0.43, F(16,170)=5.16, $p<0.001$. The canonical correlation for this function was $R_C=0.74$, indicating a strong relationship. Simply stated, group leaders who were perceived as being highly enthusiastic, who have a high ability to motivate, who have a high ability to provide personal instruction and who are available outside of the group’s regular activities were associated with higher levels of group cohesion. *Conclusions:* Although a cause-effect relationship can not be determined, the current study can serve as a valuable template in guiding future research in examining potential mechanisms that may assist with physical activity sustainability.

Key Words: women, physical activity, walking, leadership behaviour, group cohesion

1 **Introduction**

2 Engaging in regular physical activity has a beneficial effect on the health and well
3 being of the general population. Regular physical activity reduces the risk not only of
4 premature mortality, but also coronary heart disease, hypertension, some cancers, type 2
5 diabetes, osteoporosis, and poor mental health ^{1, 2}. Specific to adult women, research has
6 shown that regular participation in walking or moderate intensity physical activity reduces the
7 risk of cardiovascular disease, type 2 diabetes and certain cancers, including breast, colon,
8 endometrial and ovarian cancer ³.

9 Despite the common belief that physical activity reduces the risk of disease in women,
10 women are less likely to be sufficiently active for health benefits ⁴⁻⁶. There are factors
11 beyond personal motivation which may help to explain women's low levels of participation
12 in physical activity, including a number of psychological and cognitive, socio-cultural, and
13 environmental barriers ^{7, 8}. In response to these barriers, researchers have revealed
14 mechanisms which have the potential to assist women with engaging in regular physical
15 activity. Group based physical activity has been associated with positive outcomes including
16 increased participant attendance ⁹, reduced drop out behaviour ¹⁰, and a more positive attitude
17 towards engaging in physical activity ^{11, 12}. Estabrooks ¹³ found that adults were more likely
18 to become active and maintain an active lifestyle if they had the opportunity to interact and
19 communicate with others, gain friends, and enjoy the camaraderie of other participants.
20 Further research has suggested that one of the main factors responsible for developing and
21 maintaining this cohesiveness is the group leader ¹⁴.

22 Earlier sport psychology research has shown that leadership behaviour is viewed as a
23 crucial factor in successfully developing team cohesion ¹⁵. For instance, coaches who were
24 perceived as high in leadership behaviours (such as training and instruction, social support,
25 positive feedback, and democratic behaviours) had teams that were more cohesive ^{16, 17}.

1 Although the literature has predominately looked at the impact of the head coach-athlete
2 relationships on group cohesion, it has been suggested that other members of the coaching
3 staff, as well as team leaders, may play an equally prominent role in the dynamics of group
4 cohesion ¹⁷.

5 Further evidence indicates that a similar relationship exists in group exercise classes ¹⁸,
6 ¹⁹. Carron and Spink ¹⁸ reported an increase of cohesiveness in exercise groups resulting from
7 an exercise instructor led team building intervention. As a result of the positive impact that
8 the leader had on the group's cohesiveness, participants also indicated higher levels of overall
9 satisfaction ¹⁸. Similarly, Turner, Rejeski and Brawley ²⁰ revealed that enjoyment of the
10 exercise leaders approach to the class was related to greater feelings of revitalisation and
11 positive engagement for participants. Christensen, Schmidt, Budtz-Jorgensen, and Avlund ¹⁹
12 supported the role of the exercise leader on group cohesion, indicating that the group leader is
13 capable of developing group unity by promoting and encouraging feelings of solidarity,
14 mutual respect and acceptance. Loughead, Coleman, and Carron ²¹ added further support,
15 indicating that leader behaviour serves to produce a sense of unity, in turn, contributes to
16 greater work output and attendance. Moreover, Loughead et al. ²¹ also found that perceptions
17 of leader behaviours (i.e., motivation, enthusiasm, availability) were related to concepts of
18 group cohesion.

19 The present study extends the earlier work by Carron and Spink ¹⁸, Turner et al. ²⁰ and
20 Loughead et al. ²¹ and the more recent work by Christensen et al. ¹⁹, by investigating the
21 impact that leader behaviours may have on the cohesiveness of women's physical activity
22 groups. Previous research has examined leadership in terms of general influence ²², physical
23 characteristics of the leader ²³ and ability to provide feedback ²⁴, yet no research has
24 considered group leader behaviour, and its effect on cohesion, in the context of women's

1 physical activity²⁵. Thus, the purpose of this research was to investigate the relationship
2 between leader behaviours and group cohesiveness within women's physical activity groups.

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Methods

5 Using a convenience sampling procedure, the study sample was derived from women
6 who participated in the Women's Active Living Kit (WALK) program⁷, and continue to
7 participate in an existing program and/or physical activity group. The WALK Program aimed
8 to identify effective models for increasing women's physical activity participation and was
9 targeted at women of all ages, including women, women who were busy with careers and
10 families, women from culturally and linguistically diverse (CALD) groups, Indigenous
11 women, and disabled women. The year-long, cross-sectional pilot study included 48 priority
12 women's groups ranging in membership from 3-27 women from metropolitan, regional and
13 rural areas in New South Wales (NSW), Victoria (VIC), Australian Capital Territory (ACT)
14 and Queensland (QLD). Each group had a WALK group leader who initiated the
15 development of the group and organised group walks and/or other physical activities.

16 Women (N=322) from all 48 WALK groups were contacted via their WALK group
17 leader and invited to participate in the current study. After initial contact with the group
18 leaders explaining the purpose of the project, each leader was sent a package containing
19 information sheets and consent forms, as well as questionnaires and reply-paid envelopes, for
20 distribution to their group members. Upon receiving the packages, each group leader
21 distributed the forms to all group members and explained the purpose of the research. During
22 this time group leaders also provided verbal details of the project to group members, as well
23 as informing them that participation was completely voluntary and that they could withdraw
24 at anytime. Participants were also informed that they may contact the researchers at anytime
25 for further information or clarity regarding the project.

1 Participants were asked to complete the consent forms and the questionnaire and either
2 return it enclosed to the group leader or send it directly to the researchers. At no time did the
3 group leaders have access to their group members' responses, ensuring both participant
4 confidentiality and anonymity. Reply paid return envelopes were supplied for participants
5 and/or the leaders to return the completed forms and questionnaires to the researchers.
6 Approximately 8 weeks was allocated to the participants and group leaders for questionnaire
7 return. After the first 6 weeks, group leaders were encouraged to prompt group members to
8 complete and return the questionnaire, however, prompting was minimal as group leaders did
9 not want to further burden group members. Responses were accepted for a further two weeks.
10 Ethical approval was granted by CQ University's Human Research Ethics Committee prior to
11 the start of the project.

12 The Physical Activity Group Environment Questionnaire-PAGEQ²⁶ was used to
13 measure perceptions of group cohesion amongst the group members (including the group
14 leader). The PAGEQ has demonstrated concurrent and predictive validity in measuring
15 group cohesion with adult exercisers²⁶ and has been used in previous research specific to
16 physical activity walking groups¹¹. The questionnaire includes 21 statements pertaining to
17 the four concepts of group cohesion. Attraction to the group social (ATG-S) concept consists
18 of 6 items assessing the attractiveness of the group as a social unit and the social interaction
19 and friendship opportunities available for the individual group member. Attraction to the
20 group-task (ATG-T) consists of 6 items assessing the attractiveness of the group's task,
21 productivity and goals for the individual group member. Group integration-social (GI-S)
22 consists of 4 items assessing the individual's perceptions of the social unity within the group
23 as a whole. Finally, the GI-T scale consists of 5 items assessing the individual's perceptions
24 of task unity within the group as a whole. Examples of items which fall under each of the
25 four concepts are outlined in Table 1. All items were rated on Likert scale from 1 (strongly

1 disagree) to 9 (strongly agree). Responses for each of the four concepts were calculated
2 separately, providing an average score for ATG-S, ATG-T, GI-S, and GI-T.

3 Leadership behaviour was assessed with a modified version of a questionnaire used by
4 Remers et al.²⁴ which contains four items pertaining to participants' satisfaction with and
5 perceptions of their leader's enthusiasm, ability to motivate the group members, availability
6 outside of the group activity, and ability to provide personal instruction/advice to the group
7 members. Table 1 provides an example of each of these items. Although each of the four
8 items pertains to leadership behaviour generally, they each measure different dimensions of
9 the construct, and thus analyses were conducted using each item independently. This
10 questionnaire has been used in previous research specific to exercise groups²¹. Similar to the
11 PAGEQ, all items were rated on Likert scale from 1 (not at all satisfied) to 9 (100% satisfied).

12 In order to determine the relationship between group cohesion and leadership
13 behaviour, canonical correlation analysis was performed. Canonical correlation analysis is a
14 multivariate correlation technique that investigates the interrelationships between multiple
15 independent and multiple dependant variables. Thus, this analysis was used to determine the
16 strength of association between the four concepts of group cohesion and the four items
17 pertaining to leadership behaviour. The amount of variance in group cohesion accounted for
18 by the leadership behaviour variables was used to determine the relative importance of the
19 group cohesion constructs.

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Results

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A total of 95 women completed and returned the questionnaires, representing a
response rate of 30%. The profiles of the participants in each of the 48 groups varied and
included: young mothers, mid age women, older-elderly women, women busy with careers,
culturally and linguistically diverse women, and indigenous women. Participant demographic

1 characteristics are detailed in Table 2. The average age of the participants was 42.9 years,
2 with the majority (73.9%) of them married or in a defacto relationship. In terms of
3 geographic residents, participants were spread across rural, regional and urban areas
4 throughout NSW, VIC, ACT, and QLD. The majority of participants were employed and/or
5 performed home duties/volunteer work, whilst a small number of participants were retired,
6 fulltime students or unemployed.

7 Descriptive statistics, including the means, standard deviations and standardized
8 internal consistency reliabilities for the items assessed by the PAGEQ and Leader Behaviour
9 are listed in Table 3.

10 A significant multivariate relationship was revealed between group cohesion and
11 leadership behaviour, Wilks' lambda=0.43, $F(16,170)=5.16$, $p<0.001$. One significant
12 function emerged. The canonical correlation for this function was $R_C=0.74$, indicating a
13 significant and strong relationship.

14 A redundancy index was calculated to determine the amount of variance in the
15 dependent variables that could be explained by the independent variables. A redundancy
16 statistic of 10% is considered significant and meaningful²⁷. Canonical redundancy analysis
17 indicated that 39% of the variance in the leadership variables was explained by the group
18 cohesion variables in the first function. This function was further interpreted as the
19 redundancy index was considered significant and meaningful.

20 Canonical cross loadings were inspected in the first function to ascertain the important
21 variables contributing to the multivariate relationship. The magnitude of the cross loadings
22 specifies the relative contribution of the variable to the multivariate relationship, while the
23 sign indicates the direction of the relationship. Similar signs indicate a direct relationship
24 between variables, and opposite signs indicate an inverse relationship. According to
25 Pedhazur²⁷, loadings greater than .30 indicate a significant and meaningful relationship.

1 The multivariate results indicate that there is a significant positive relationship
2 between concepts of group cohesion and leader behaviour variables. The loadings suggested
3 that all four leader behaviours were important in explaining the relationship with cohesion
4 (Figure 1), with ability to motivate group members (.98) achieving the highest loading,
5 followed by the ability to be enthusiastic (.96) and the ability to provide personal instruction
6 (.92). Being available outside of the group's regular activities (.42) revealed a low to
7 moderate loading. Similarly, all concepts of group cohesion were also found to be important
8 contributors to the multivariate relationship and revealed moderate to high positive loadings
9 with ATG-T (.63) contributing the most, followed by GI-T (.64), GI-S(.60), and ATG-S (.50).
10

11 Discussion

12 The primary purpose of this study was to investigate the relationship between leader
13 behaviours and group cohesion within women's walking groups. Analysis revealed a
14 relationship between concepts of group cohesion and leader behaviour variables. Specifically,
15 these findings suggested that group leaders who are enthusiastic, have the ability to motivate
16 their group members, are able to provide personal instruction to each group member and are
17 available outside of the group for further advice, were likely to have greater cohesiveness
18 within their groups. Although all leader behaviours and group cohesion concepts produced
19 significant and meaningful relationships, three of the leader behaviours (enthusiasm,
20 motivation, and instruction provision) revealed the greatest loadings. In terms of the
21 concepts of group cohesion, ATG-T and GI-T also displayed the greatest loadings. These
22 findings are relatively consistent with Loughhead et al.,²¹ work, in which leader behaviours of
23 enthusiasm, motivation and availability was positively associated with task cohesion. Unlike
24 Loughhead et al.²¹, the present study found a greater relationship between the leader
25 behaviours of enthusiasm, motivation, instruction provision, rather than availability, and

1 concepts of task cohesion. This is not surprising as early sport-specific work has suggested
2 that coaches who are perceived to engage in instruction and training with their team members
3 are likely to have higher levels of task cohesion ¹⁶. It may be that the women who attended
4 the physical activity groups may have been task or goal directed in their efforts to initially
5 join the group (such as wanting to increase their activity) and relied on the leader to provide
6 enthusiasm, motivation and instruction in order to complete their task or reach their goal. As
7 such, leaders may have fostered an environment that focused on task-related behaviours such
8 as providing task-specific reinforcements, encouraging before and after a skill or activity
9 session was performed, and focusing on task specific instructions ²⁸. Furthermore, the low
10 loadings surrounding the concept of ‘availability outside of the group’, may lend further
11 support to task cohesion as women may have felt that the leader’s availability outside of the
12 group did not make an important contribution to reaching their task or goal.

13 Although task cohesion and task related leader behaviours were dominant in the
14 present study, concepts of social cohesion were also significant and revealed a meaningful
15 relationship. This finding is inconsistent with previous sport specific and exercise group
16 research, suggesting that leader (coach) behaviours have a greater influence on task cohesion
17 rather than social cohesion ^{16,21}. However, there is evidence that gender may help to explain
18 this task/social cohesion discrepancy. Duncan, Duncan and McAuley ²⁹ found that women
19 rated concepts of social provisions, such as guidance and reassurance of worth, as important
20 aspects of program adherence in an exercise program. In contrast, social provisions amongst
21 men were not significant. It is not surprising that the present study parallels the work of
22 Duncan et al. ²⁹, as it only involved a female sample. Thus, leaders should consider the
23 variance between different types of groups, such as male and female groups, and structure
24 their physical activity group environment in a way that meets the varying needs of different

1 populations. Knowing that concepts of social cohesion are important factors to women's
2 adherence to physical activity will assist leaders with doing this^{14, 20, 30}.

3 Although, gaining insight into the particular needs of women is necessary for the
4 development of programs targeted towards women, restricting the study sample to women
5 only can also be perceived as a limitation. It is possible that other populations (e.g. men,
6 younger, older) differ in their perceptions of leader behaviours and are influenced by different
7 concepts of group cohesion, thus providing an avenue for future research. Additionally, this
8 study does not examine the potential reciprocal relationship between the leader and group
9 members. It is very probable that leaders have varying perspectives to their group members
10 concerning the leader behaviours which influence a group as a whole. It would be valuable
11 to assess the perceptions of the leaders, in addition to the group members, and compare the
12 similarities and differences between the leader and group members. This will provide leaders
13 with information regarding group member expectations, as well as provide leaders with the
14 opportunity to adapt certain leader behaviours to align with the needs of the group members.

15 It is also important to address the potential selection bias that may result due to the
16 involvement of the group leaders in encouraging group members to participate in the study by
17 assisting with the dissemination of project information and the distribution of questionnaires.
18 Although precautions were undertaken to limit selection bias, the authors understand that
19 participant responses may be subject to such bias. Future research should consider other
20 methods of encouraging project participation in order to limit selection bias.

21 Lastly, this study did not measure physical activity behaviour and thus can not
22 indicate a cause-effect relationship between leadership behaviour, group cohesion and
23 physical activity behaviour. Although the results of this study, as well as based on previous
24 research, may suggest that leadership behaviour and group cohesion can potentially act as a
25 mechanism that may influence physical behaviour. Future research should include physical

1 activity behaviour as an outcome measure. As a further extension to this, future research
2 should also include a larger sample size in which more advanced analysis (such as structural
3 equation modelling, moderator analysis) can be undertaken in order to reveal the potential
4 causal pathways between specific variables. It should also be noted that the data were
5 clustered in nature but the authors did not adjust for clustering in their analyses.

6

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Conclusions

8 In conclusion, this study provides valuable information for researchers and
9 practitioners as it identifies potential variables that could impact on the sustainability of
10 physical activity programs for women. With the gradual shift in physical activity
11 recommendations away from exercise-based activity to more lifestyle-based physical activity,
12 it is important to note that groups leader behaviour, even in less formal groups such as the
13 walking groups studied here, can have an influence on the group's perceptions of cohesion.
14 The findings of the current study indicate that group leaders, who are enthusiastic, with the
15 ability to motivate, provide personal instructions and are available outside of the group, were
16 likely to have greater cohesiveness within their groups. These findings extend previous
17 research and provide further information concerning the impact that external variables, such
18 as leadership and group cohesion, may have on the physical activity behaviours of women.
19 With standing the limitations of the current study, the results can serve as a valuable template
20 in guiding future research in examining potential mechanisms that may assist with physical
21 activity sustainability.

22

Practical Implications

- 23 • Health professionals designing and delivering physical activity programs for women
24 must be gender sensitive to the needs and interests of women.

1 • There is a need to focus on task oriented physical activity goals in women’s physical
2 activity groups, however providing an opportunity for social engagement should also
3 be considered.

4 • Community and group members who exhibit certain behaviours/abilities (i.e.
5 enthusiastic, ability to motivate, provide personal instructions and who are readily
6 available) should be encouraged to take on leadership roles within health promotion
7 initiatives.

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11 Department of Families, Community Services and Indigenous Affairs, Commonwealth of
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Disclosures

15 The authors have no conflicts of interest that are directly related to the contents of this
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1 **Table 1. Items assessing Group Cohesion and Leader Behaviour**

Item	Example
PAGEQ:	
<i>ATG-Social</i>	“I enjoy my social interactions within this physical activity group”
<i>ATG-Task</i>	“I am happy with the intensity of the physical activity in this group”
<i>GI-Social</i>	“Members of our physical activity group often socialise during exercise time”
<i>GI-Task</i>	“Our group is united in its beliefs about the benefits of the physical activities offered in this program”
Remer’s Leader Behaviour:	
<i>Enthusiasm</i>	“Our leader/instructor is enthusiastic”
<i>Ability to motivate</i>	“Our leader/instructor has the ability to motivate group members”
<i>Outside availability</i>	“Our leader/instructor is available outside of the group’s regular activities”
<i>Ability to provide personal instruction</i>	“Our leader/instructor has the ability to provide personal instruction to group members”

2

1 **Table 2. Demographic Characteristics of Participants**

Characteristics	<i>N</i> =95
Mean age \pm SD, y	42.9 \pm 13.9
Marital Status, N (%)	
Single, living alone	9 (9.6)
Single, living with others	9 (9.6)
Single, living with children	6 (6.3)
Married/Defacto, with dependants	19 (20.2)
Married/Defacto, no dependants	52 (54.3)
Employment Status, N (%)	
Employed	63 (66.2)
Not employed	4 (4.2)
Retired	7 (7.4)
Home duties/volunteer	16 (16.9)
Student	5 (5.3)
Geographic Residence, N (%)	
Rural	28 (29.5)
Regional	39 (41.1)
Urban	28 (29.5)

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1 **Table 3. Descriptive Statistics of the items assessed by the PAGEQ and Leader**
 2 **Behaviours**

Item	Mean	SD	α
<i>PAGEQ:</i>			
ATG-S	7.8	1.4	.92
ATG-T	7.4	1.6	.96
GI-S	7.7	1.2	.89
GI-T	7.2	1.7	.92
Enthusiasm	8.1	1.2	-
Ability to motivate	8.0	1.3	-
Outside availability	7.9	1.5	-
Ability to provide personal instruction	7.2	2.4	-

3 *Note.* PAGEQ=Physical Activity Group Environment
 4 Questionnaire; ATG-S=Attraction to the Group-Social;
 5 ATG-T=Attraction to the Group-Task; GI-S=Group
 6 Integration-Social; GI-T=Group Integration-Task.

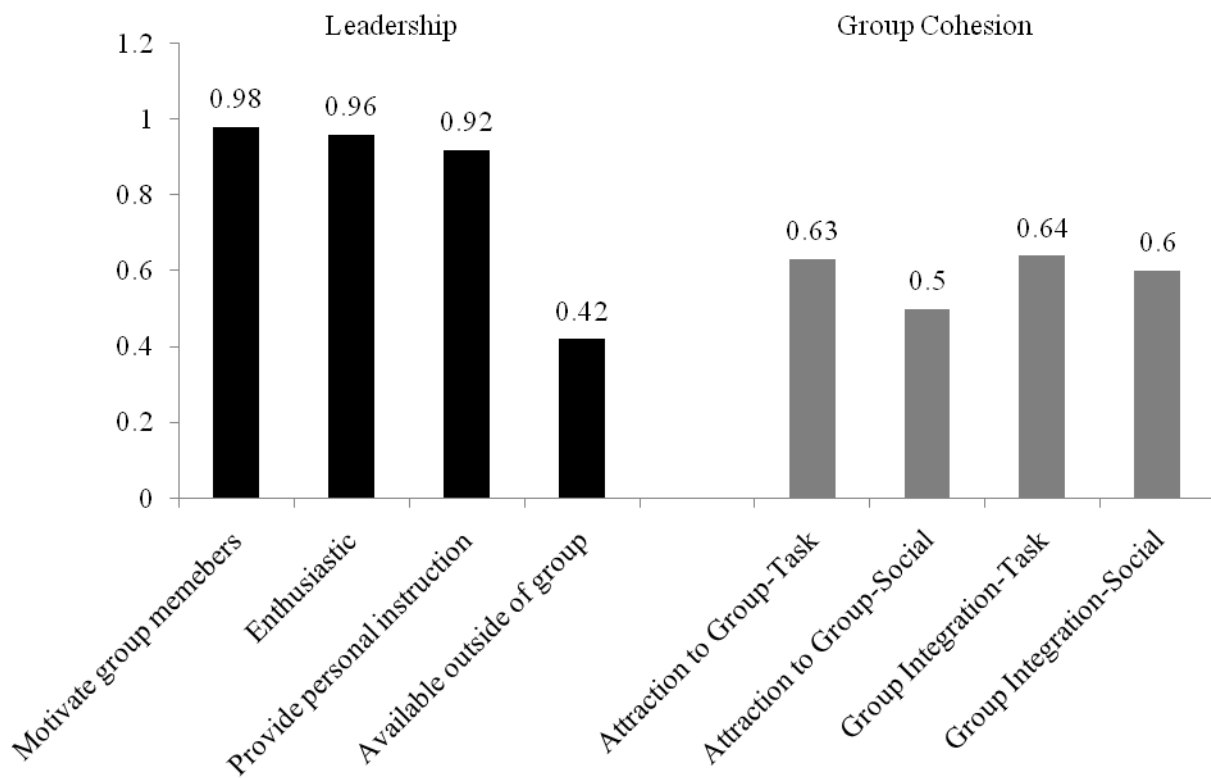


Figure 1. Canonical cross loadings for leadership and group cohesion