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INTERACTION BETWEEN GROUPTHINK PREDICTORS AND MAINTAINING THEIR MODERATE VALUES

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Abstract

The purpose of the paper is to examine how groupthink predictors interact with each other and identify the movement of their values. That can simplify how to prevent groupthink. Survey data was collected from 315 employees of working groups. The survey was used to collect groupthink data through its eight predictors. Multiple linear regression was used for analyzing data collected from the survey. All groupthink predictors correlate with each other, but the study also shows a division of predictors into positive and negative predictors. When positive predictors have a high value, negative predictors will have a low value and vice versa. That shows that it is not recommended to have a high or low value of groupthink predictors, because that may cause groupthink. Due to the lack of research conducted on the questionnaire, the main research challenge was to establish a correlation between those new predictors and to explain some of the questions raised in the criticism of the original theory.

Keywords: Groupthink, Predictors, Working Group, Decision-making

1. Introduction

The groupthink theory was formulated in 1972 and was upgraded in 1982 as a mode of thinking, in which members of a highly cohesive group strive for unanimity and consensus, overriding their motivation to realistically appraise alternative courses of action (Janis, 1982). Janis (1982) developed a model that represents the causal relationship between the individual elements in five steps. Those steps are groupthink antecedents that result in a concurrence-seeking tendency, which is shown by symptoms of groupthink, leading to symptoms of defective decision-making, and, finally, poor decision outcomes. According to Tarmo and Issa (2022), groupthink impedes group communication, resulting in less information and alternatives being gathered on how to solve a particular problem. Later, Janis's theory was tested with different methodological approaches. Case studies examined the possibility of the occurrence of groupthink in the

Challenger disaster (Esser and Lindoerfer, 1989; Moorhead *et al.* 1991), falling stock prices in British Airways and Marks & Spencer (Eaton, 2001), the collapse of Swissair (Hermann and Rammal, 2010), mass resignations of MLUA members in 1999 (Koerber and Neck, 2003), to mention just a few. Although the findings of researchers who studied groupthink through case studies support the Janis model, the factors that trigger groupthink are unclear and vary depending on the cases studied (Chapman, 2006).

In experimental studies of groupthink, antecedents were tested most often (Flowers, 1977; Moorhead and Montanari, 1986; Bernthal and Insko, 1993; Hogg and Hains, 1998; Chapman, 2006; Cruz *et al.* 1999; Schafer and Crichlow, 1996). Despite many empirical studies of groupthink, many researchers did not agree with the validity of the model and started criticizing it (McCauley, 1989; Park, 1990; Aldag and Fuller, 1993; Turner and Pratkanis, 1998; Whyte, 1998; Fuller and Aldag, 1998; Henningsen *et al.* 2006). Or maybe researchers should have used Whyte's (1952) managerial theory of groupthink, rather than Janis' social psychological theory (Pol *et al.* 2022). Researchers started to develop new concepts on the same topic. Aldag and Fuller (1993) developed the GGPS model, Whyte (1998) replaced Janis' cohesiveness with collective efficacy, Neck and Manz (1994) developed the model of "Teamthink", while Mintz and Wayne (2016) developed the model of "Polythink", to mention just a few.

Allen (2001) points out that diversity in supporting and unsupporting studies of theory has shown problems with research methodology. That leads to the question of whether the theory was tested correctly. Therefore, Baptist (2015) developed a questionnaire in which groupthink is measured retrospectively by its predictors after the poor outcome of workgroup decision-making has already occurred. Baptist's groupthink predictors differ a little from Janis' antecedents because he developed a questionnaire and predictors based on the original theory and its critics, which did not support all the elements of Janis' groupthink model. He also added three predictors, which were included in studies from other authors. The groupthink predictors which are included in his study, and used in our research, are Highly cohesive, Promotional leadership, Conformity, Concurrence seeking, Anxiety, Collective efficacy, Hidden profiles, and Trust.

Janis (1982) represented nine steps for preventing the occurrence of groupthink, where the Devil's advocate technique is most popular among researchers. In summary, other steps are the recommendation for leaders not to be directive, preventing group isolation from other groups and external experts, and encouraging concerns on group majority and leader opinions. Yim and Park (2021) highlight the problem of group isolation and accepting only group majority opinions, finding that both factors interact with groupthink in group culture. In later studies, other authors also added recommendations for preventing groupthink. The techniques include brainstorming (Baptist, 2015), dialectic method technique (Sims, 1992), creating Teamthink in groups (Neck and Manz, 1994), creating gender non-homogeneity groups (Katopol, 2015; Kamalnath, 2017; Bergman, 2021), teaching about groupthink in universities (Silver, 2014), training for leaders and other group members with the simulation of a groupthink condition (Janis and Mann, 1977), encouragement of critical thinking, to mention just a few.

Finally, Janis (1982) adds that if group members want to avoid groupthink, they must maintain a moderate value of cohesiveness, because a value that is too high leads to concurrence seeking, while a value that is too low leads to conformity out of fear of recrimination. Janis and Mann (1977) add that the group should also have a moderate level of stress among its members, because low stress causes members to pay little attention to potential future negative consequences, whereas high stress causes defensive avoidance and disruptive over-alertness, such as panic (Janis and Mann, 1977). Tasa and Whyte (2005) found that a moderate value of collective effectiveness was also required for vigilant problem solving and to prevent groupthink, while Erdem (2003) states that there should be optimal trust between group members, because excessive trust impacts negatively on performance and behavior. Because of the statements mentioned above that groups have to maintain a moderate value of groupthink predictors, our goal was to determine the value movement of the individual predictor based on changes in the value of the other predictors.

The research is based on Park's criticism of the original theory. Janis (1982) indicates that groupthink predictors need to interact with other groupthink predictors to produce groupthink. Park (1990) points out that Janis did not explain how the interaction between predictors occurs,

leaving the relationships between predictors to question the imagination of the readers. The main goals of the research were then to find out the statistically significant correlation between groupthink predictors and the statistically significant effect of groupthink predictors on a single predictor, which could explain that unexplained interaction. Two hypotheses were made:

H_1: Groupthink predictors correlate with each other.

H_2: Changing the value of one groupthink predictor affects changing the values in other groupthink predictors.

Groupthink is considered when the outcome of a group decision is poor and is caused by similar thinking in group decision-making. Most studies therefore only examine poor results, but according to Kramer and Dougherty (2013), poor decision-making processes can also lead to ambiguous or even successful results. Therefore, Baptist (2015) believes if groupthink does not always lead to a bad decision, it is difficult to measure groupthink, retrospectively. Still, without a retrospective way of research, according to Baptist (2015), it is very difficult to predict whether groupthink will occur in the future. This ambiguity of the theory is also mentioned by Turner and Pratkanis (1998), who state that it is difficult to measure the occurrence of groupthink, since it has many dependent and independent variables, and it is not completely clear how to integrate ambiguous theory into research. Therefore, we used a multiple regression analysis, where groupthink predictors are the dependent variable in one regression; in other regressions, they are among the set of independent variables.

With this methodological approach, we hoped to develop our recipe for avoiding groupthink in working groups, or to find another way to form collective decision-making groups while avoiding groupthink, as Reinero (2021) points out. This could potentially help managers and their organizations, particularly those that are rigid and less adaptable (Stazky and Davis, 2021), protect work groups from groupthink, especially during times of crisis, when organizations are especially susceptible to groupthink when quick decisions are made. This refers to an organization's poor crisis management (Yim and Park, 2021). Thus, our research could assist organizations in adequately preparing for a potential crisis, elevating crisis management to a higher level.

2. Methodology

Groupthink was measured using a questionnaire developed by Baptist (2015) which contains 49 statements. All of the statements are divided into eight parts, representing the eight predictors of groupthink. The questionnaire statements represent the respondents' agreement with the groupthink predictors on the Likert 5-point scale, whereby 1 strongly disagrees and 5 strongly agrees. The questionnaire was used retrospectively to identify whether predictors of groupthink were present when a poor decision was made in the workgroup.

The questionnaire was sent to members of workgroups in Slovenian organizations. It was fully completed by 315 employees, of which 151 were men (48%) and 164 were women (52%). The average age of the respondents was 37.2 (± 11.56) years, of which the majority of the respondents form part of the 18–28 (35.6%) and 29–39 (24.1%) age groups. The majority of the respondents completed ISCED level of education 4 (33.7%), 6 (26.7%), and 7 (19.7%). The questionnaire was completed by 43 (13.7%) group leaders and 272 (86.3%) non-group leaders.

On average, the respondents have 8.7 (± 9.14) years of service in their current workgroup, of which the majority of the respondents form part of the 0–5 years (54%) and 10 years or more (29.5%) groups. On average, the respondents' workgroup has 15 (± 22.7) group members, of which the majority of the respondents operate in small workgroups with 3-6 members (37.8%). 223 (70.8%) of the respondents work in groups consisting of members of both genders, and 92 (29.2%) of those work in groups composed of one gender. The demographic characteristics of respondents are explained in detail in Table 1. The survey was conducted between July and November 2019, when all the data was collected.

Table 1. Demographic characteristics of respondents

Variable	Categories	Percentage	Number
Gender	Male	48	151
	Female	52	164
Age	18 - 28 years	35.6	112
	29 - 39 years	24.1	76
	40 - 50 years	21.9	69
	> 50 years	18.4	51
Level of education	Primary education	2.5	8
	Secondary education	33.7	106
	Post-secondary education	13.7	43
	Bachelor's degree	26.7	84
	Master's degree	19.7	62
	Master of Science	1.6	5
	Doctorate	2.2	7
Position	Group leader	13.7	43
	Another group member	86.3	272
Years of service in their current workgroup	0 - 5	54	170
	6 - 10	16.5	52
	> 10	29.5	93
Number of group members in a group	3 - 6	37.8	119
	7 - 10	26	82
	> 10	36.2	114
Group composition	One gender group	29.2	92
	Both genders group	70.8	223

Source: Author's work

Following the responses to the questionnaire, the data were analyzed using SPSS. Multiple linear regression was used to determine the dependence of whether a group of groupthink predictors has an effect on a single predictor and if predictors correlate with each other. Eight multiple linear regressions were performed individually for each predictor. Multiple linear regression uses a backward method. The first model uses all seven remaining groupthink predictors as predictors of a single predictor. Then, the backward method eliminates any predictor in the regression that satisfies the set exclusion criteria, if they do not contribute statistically to the particular model. The criterion set for eliminating the predictor from the model is $p > 0.05$. For each eliminated predictor, the multiple linear regression uses a backward method to determine a new predictor model, which then further checks the predictors for elimination, and eliminates the predictor with the highest P-value. The process is repeated many times until none of the remaining predictors are candidates for elimination in the final model. The final model then also shows which set of predictors statistically significantly predicts or influences a single groupthink predictor. The statistically significant value of the tests ($p < 0.05$) suggests a statistically significant correlation or effect between variables, which allows us to contribute our hypotheses.

3. Research

The results of the correlation analysis are presented in the correlation matrix, which is illustrated in Table 2. The correlation matrix shows that all predictors are statistically significantly correlated ($p < 0.001$). In particular, the groupthink predictors highly cohesive, collective efficacy, and trust have a positive correlation with one another. They negatively correlate with the groupthink predictors' promotional leadership, conformity, concurrence seeking, anxiety, and hidden profiles. On the other hand, the groupthink predictors' promotional leadership, conformity, concurrence seeking, anxiety, and hidden profiles, positively correlate with each other. They negatively correlate with the groupthink predictors' highly cohesive, collective efficacy, and trust. The correlation matrix also shows that there is not a very strong correlation between them ($r > 0.08$).

This is important for performing multiple linear regression between predictors, because strong correlations would represent a multicollinearity problem, and the results of multiple linear regression would not be reliable. Since the correlation analysis satisfied that assumption, eight multiple linear regressions between the predictors were performed.

Table 2. Correlation matrix between groupthink predictors

	1	2	3	4	5	6	7	8
1 Highly cohesive	-							
2 Promotional leadership	-0.447*	-						
3 Conformity	-0.360*	0.554*	-					
4 Concurrence seeking	-0.408*	0.619*	0.728*	-				
5 Anxiety	-0.266*	0.509*	0.561*	0.698*	-			
6 Collective efficacy	0.580*	-0.516*	-0.430*	-0.548*	-.0343*	-		
7 Hidden profiles	-0.478*	0.428*	0.421*	0.437*	0.243*	-0.552*	-	
8 Trust	0.624*	-0.473*	-0.420*	-0.481*	-0.308*	0.693*	-0.662*	-

Note: P-values are denoted with: * for statistical significance correlation at the 0.001 level (2-tailed), N = 315

Source: Author's work

The first multiple regression verifies that the predictor highly cohesive can be predicted by other predictors of groupthink. Multiple linear regression with the backward method fitted five models. In the final model, the remaining predictors trust, promotional leadership, and collective efficacy, explained 44.5% (r2 = 0.445) of the variance in the groupthink predictor highly cohesive, $F(3, 311) = 83.014$, $p < 0.001$. As can be seen from Table 3, the analysis of regression coefficients showed that the predictors promotional leadership (B = -0.161, t = - 2.756, p = 0.006), collective efficacy (B = 0.303, t = 3.807, p < 0.001), and trust (B = 0.545, t = 6.648, p < 0.001), statistically significantly predict high group cohesiveness. Due to the negative B value, promotional leadership is negatively correlated with highly cohesive. That means that if the value of promotional leadership increases (decreases) by 1 unit, the value of highly cohesive decreases (increases) by 0.161 units if the other predictors are held constant. Collective efficacy and trust are positively correlated with highly cohesive because of the positive B value. That means that if the value of collective efficacy increases (decreases) by 1 unit, the value of high cohesive also increases (decreases) by 0.303 units if the other predictors are held constant. Finally, if the value of trust increases (decreases) by 1 unit, the value of highly cohesive also increases (decreases) by 0.545 units if the other predictors are held constant.

Table 3. Regression model for groupthink predictor highly cohesive

	Unstandardized Coefficients		**Standardized Coefficients**			**Collinearity Statistics**
Predictors	**B**	**S.E.**	**β**	**t**	**Sig.**	**VIF**
Constant	1.093	0.376		2.910	0.004*	
Promotional leadership	-0.161	0.058	-0.138	-2.756	0.006*	1.413
Collective efficacy	0.303	0.080	0.234	3.807	0.000**	2.109
Trust	0.545	0.082	0.397	6.648	0.000**	1.993

Note: P-values are denoted with * and ** for statistical significance at 1% and 0.1% level, respectively. r = 0.667, r2 = 0.445, F = 83.014**

Source: Author's work

The second multiple regression tested whether the other predictors of groupthink could predict promotional leadership. Multiple linear regression fitted three models. In the final model, the remaining predictors, anxiety, conformity, highly cohesive, collective efficacy, and

concurrence seeking, explained 47.3% (r2 = 0.473) of the variance in groupthink predictor, promotional leadership, F (5, 309) = 55,428, p < 0.001. As can be seen in Table 4, the analysis of the regression coefficients showed that the predictors highly cohesive (B = -0.126, t = - 2.859, p = 0.005), conformity (B = 0.182, t = 2.805, p = 0.005), concurrence seeking (B = 0.242, t = -3.086, p = 0.002), anxiety (B = 0.149, t = 2.756, p = 0.010), and collective efficacy (B = -0.200, t = -3.200, p = 0.002) make a statistically significant prediction of promotional leadership in the group. Due to the negative B value, highly cohesive and collective efficacy are negatively correlated with promotional leadership.

Table 4. Regression model for groupthink predictor promotional leadership

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics
Predictors	**B**	**S.E.**	**β**	**t**	**Sig.**	**VIF**
Constant	2.570	0.318		8.082	0.000***	
Highly cohesive	-0.126	0.044	-0.147	-2.859	0.005**	1.544
Conformity	0.182	0.065	0.171	2.805	0.005**	2.178
Concurrence seeking	0.242	0.078	0.232	3.086	0.002**	3.322
Anxiety	0.149	0.058	0.150	2.576	0.010*	1.984
Collective efficacy	-0.200	0.062	-0.179	-3.200	0.002**	1.834

Note: P-values are denoted with *, ** and *** for statistical significance at 5%, 1% and 0.1% level, respectively. r = 0.688, r2 = 0.473, F = 55.428***

Source: Author's work

That means that if the value of high cohesive increases (decreases) by 1 unit, the value of promotional leadership decreases (increases) by 0.126 units if the other predictors are held constant. If the value of collective efficacy increases (decreases) by 1 unit, the value of promotional leadership decreases (increases) by 0.2 units, if the other predictors are held constant. Conformity, concurrence seeking, and anxiety are positively correlated with promotional leadership because of the positive B value. That means that if the value of conformity increases (decreases) by 1 unit, promotional leadership also increases (decreases) by 0.182 units if the other predictors are held constant. If the value of concurrence seeking increases (decreases) by 1 unit, promotional leadership also increases (decreases) by 0.242 units, if the other predictors are held constant. Finally, if the value of anxiety increases (decreases) by 1 unit, promotional leadership also increases (decreases) by 0.149 units, if the other predictors are held constant.

The third multiple regression verifies that conformity can be predicted by other predictors of groupthink. Multiple linear regression fitted five models. In the final model, the remaining predictors, promotional leadership, concurrence seeking, and hidden profiles, explained 55.5% (r2 = 0.555) of the variance in groupthink predictor conformity, F (3, 311) = 129,440, p < 0.001. As can be seen in Table 5, the analysis of the regression coefficients showed that the predictors promotional leadership (B = 0.133, t = 2.864, p = 0.004), concurrence seeking (B = 0.583, t = 12.024, p < 0.001) and hidden profiles (B = 0.089, t = 2.325, p = 0.021) statistically significantly predicted group conformity. Due to the positive B value, all predictors are positively related to the groupthink predictor conformity. That means that if the value of promotional leadership increases (decreases) by 1 unit, the value of conformity increases (decreases) by 0.133 units if the other predictors are held constant. If the value of concurrence seeking increases (decreases) by 1 unit, the value of conformity increases by 0.583 units, if the other predictors are held constant. Finally, if the value of hidden profiles increases (decreases) by 1 unit, the value of conformity increases (decreases) by 0.089 units, if the other predictors are held constant.

Table 5. Regression model for groupthink predictor conformity

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics
Predictors	**B**	**S.E.**	**β**	**t**	**Sig.**	**VIF**
Constant	0.566	0.128		4.417	0.000***	
Promotional leadership	0.133	0.046	0.142	2.864	0.004**	1.708
Concurrence seeking	0.583	0.048	0.597	12.024	0.000***	1.723
Hidden profiles	0.089	0.038	0.100	2.325	0.021*	1.301

Note: P-values are denoted with *, ** and *** for statistical significance at 5%, 1% and 0.1% level, respectively. r = 0.745, r2 = 0.555, F = 129.440***

Source: Author's work

The fourth multiple regression verifies that concurrence seeking can be predicted by other predictors of groupthink. Multiple linear regression fitted four models. In the final model, the remaining predictors, anxiety, promotional leadership, conformity, and collective efficacy, explained 70.8% (r2 = 0.708) of the variance in groupthink predictor concurrence seeking, F (4, 310) = 187.845, $p < 0.001$. As can be seen in Table 6, the analysis of the regression coefficients showed that the predictors promotional leadership (B = 0.125, t = 3.176, p = 0.002), conformity (B = 0.380, t = 9.116, $p < 0.001$), anxiety (B = 0.340, t = 9.168, $p < 0.001$), and collective efficacy (B = −0.214, t = −5.441, $p < 0.001$) statistically significantly predicted concurrence seeking. Collective efficacy is negatively correlated with concurrence seeking because of its negative B value. That means that if the value of collective efficacy increases (decreases) by 1 unit, the value of concurrence seeking decreases (increases) by 0.214 units if the other predictors are held constant. Promotional leadership, conformity, and anxiety are positively correlated with concurrence seeking because of a positive B value. That means that if the value of promotional leadership increases (decreases) by 1 unit, the value of concurrence seeking also increases (decreases) by 0.125 units if the other predictors are held constant. If the value of conformity increases (decreases) by 1 unit, the value of concurrence seeking also increases (decreases) by 0.38 units, if the other predictors are held constant. If the value of anxiety increases (decreases) by 1 unit, the value of concurrence seeking also increases (decreases) by 0.34 units, if the other predictors are held constant.

Table 6. Regression model for groupthink predictor concurrence seeking

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics
Predictors	**B**	**S.E.**	**β**	**t**	**Sig.**	**VIF**
Constant	1.065	0.233		4.567	0.000**	
Promotional leadership	0.125	0.040	0.130	3.176	0.002*	1.790
Conformity	0.380	0.042	0.371	9.116	0.000**	1.756
Anxiety	0.340	0.037	0.355	9.168	0.000**	1.593
Collective efficacy	-0.214	0.039	-0.199	-5.441	0.000**	1.423

Note: P-values are denoted with * and ** and for statistical significance at 1% and 0.1% level, respectively. r = 0.841, r2 = 0.708, F = 187.845**

Source: Author's work

The fifth multiple regression verifies whether anxiety can be predicted by other predictors of groupthink. Multiple linear regression fitted five models. In the final model, the remaining predictors promotional leadership, hidden profile, and concurrence seeking, explained 50.5% (r2 = 0.505) of the variance in groupthink predictor anxiety, F (3, 311) = 105.905, $p < 0.001$. As can be seen in Table 7, the analysis of the regression coefficients showed that the predictors promotional leadership (B = 0.152, t = 2.893, p = 0.004), concurrence seeking (B = 0.681, t = 12.436, $p < 0.001$), and hidden profiles (B = −0.101, t = −2.336, p = 0.020) statistically significantly predicted anxiety. Due to the negative B value, hidden profiles are negatively correlated with anxiety. That means that if the value of the hidden information increases (decreases) by 1 unit,

the value of anxiety decreases (increases) by 0.101 units if the other predictors are held constant. Promotional leadership and concurrence seeking are positively correlated with anxiety because of the positive B value. That means that if the value of promotional leadership increases (decreases) by 1 unit, the value of anxiety also increases (decreases) by 0.152 units if the other predictors are held constant. If the value of the concurrence seeking increases (decreases) by 1 unit, the value of anxiety also increases (decreases) by 0.681 units, if the other predictors are held constant.

Table 7. Regression model for groupthink predictor anxiety

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics
Predictors	**B**	**S.E.**	**β**	**t**	**Sig.**	**VIF**
Constant	0.906	0.145		6.254	0.000***	
Promotional leadership	0.152	0.052	0.151	2.893	0.004**	1.708
Concurrence seeking	0.681	0.055	0.651	12.436	0.000***	1.723
Hidden profiles	-0.101	0.043	-0.106	-2.336	0.020*	1.301

Note: P-values are denoted with *, ** and *** for statistical significance at 5%, 1% and 0.1% level, respectively. r = 0.711, r2 = 0.505, F = 105.905***

Source: Author's work

The sixth multiple regression verifies whether collective efficacy can be predicted by other predictors of groupthink. Multiple linear regression fitted four models. In the final model, the remaining predictors trust, promotional leadership, highly cohesive, and concurrence seeking, explained 57% (r2 = 0.570) of the variance in groupthink predictor collective efficacy, F (4, 310) = 102,584, p < 0.001. As can be seen from Table 8, the analysis of the regression coefficients showed that the predictors highly cohesive (B = 0.138, t = 3.673, p < 0.001), promotional leadership (B = - 0.096, t = - 2.151, p = 0.032), concurrence seeking (B = −0.186, t = - 4.046, p < 0.001), and trust (B = 0.459, t = 8.552, p < 0.001) statistically significantly predicted collective efficacy in the group. Promotional leadership and concurrence seeking are negatively correlated with collective efficacy, due to the negative B value. That means that if the value of promotional leadership increases (decreases) by 1 unit, the value of collective efficacy decreases (increases) by 0.096 units if the other predictors are held constant. If the value of concurrence seeking increases (decreases) by 1 unit, the value of collective efficacy decreases (increases) by 0.186 if the other predictors are held constant. Highly cohesive and trust are positively correlated with collective efficiency, due to the positive B value. That means that if the value of highly cohesive increases (decreases) by 1 unit, then the value of collective efficacy also increases (decreases) by 0.136 units if the other predictors are held constant. Finally, if the value of trust increases (decreases) by 1 unit, then the value of collective efficacy also increases (decreases) by 0.459 units if the other predictors are held constant.

Table 8. Regression model for groupthink predictor collective efficacy

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics
Predictors	**B**	**S.E.**	**β**	**t**	**Sig.**	**VIF**
Constant	2.431	0.255		9.529	0.000**	
Highly cohesive	0.138	0.038	0.180	3.637	0.000**	1.726
Promotional leadership	-0.096	0.045	-0.107	-2.151	0.032*	1.783
Concurrence seeking	-0.186	0.046	-0.200	-4.046	0.000**	1.757
Trust	0.459	0.054	0.434	8.552	0.000**	1.854

Note: P-values are denoted with * and ** for statistical significance at 5% and 0.1% level, respectively. r = 0.755, r2 = 0.570, F = 102.584**

Source: Author's work

The seventh multiple regression verifies that hidden profiles can be predicted by other predictors of groupthink. Multiple linear regression fitted five models. In the final model, the remaining predictors trust, conformity, and collective efficacy, explained 47.3% (r2 = 0.473) of variance in groupthink predictor hidden profiles, F (3, 311) = 92.945, p < 0.001. As can be seen in Table 9, the analysis of the regression coefficients showed that the conformity (B = 0.169, t = 3.243, p = 0.001), collective efficacy (B = - 0.162, t = - 2.366, p = 0.019), and trust (B = - 0.625, t = - 8.653, p < 0.001) statistically significantly predict hidden profiles. Collective efficacy and trust are negatively correlated with hidden profiles, due to the negative B value. That means that if the value of collective efficacy increases (decreases) by 1 unit, the value of hidden profiles decreases (increases) by 0.162 units if the other predictors are held constant. If the value of trust increases (decreases) by 1 unit, the value of hidden profiles decreases (increases) by 0.625 units if the other predictors are held constant. Due to the positive B value, conformity is positively correlated with hidden profiles. That means that if the value of conformity increases (decreases) by 1 unit, the value of hidden profiles also increases (decreases) by 0.169 units if the other predictors are held constant.

Table 9. Regression model for groupthink predictor hidden profiles

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics
Predictors	**B**	**S.E.**	**β**	**t**	**Sig.**	**VIF**
Constant	4.819	0.305		15.804	0.000***	
Conformity	0.169	0.052	0.151	3.243	0.001**	1.272
Collective efficacy	-0.162	0.069	-0.138	-2.366	0.019*	2.014
Trust	-0.625	0.072	-0.503	-8.653	0.000***	1.993

Note: P-values are denoted with *, ** and *** for statistical significance at 5%, 1% and 0.1% level, respectively. r = 0.688, r2 = 0.473, F = 92.945***

Source: Author's work

The last multiple regression verifies that trust can be predicted by other predictors of groupthink. Multiple linear regression fitted five models. In the final model, the remaining predictors hidden profiles, highly cohesive, and collective efficacy, explained 63.3% (r2 = 0.633) of the variance in groupthink predictor trust, F (3, 311) = 178.518, p < 0.001. As can be seen in Table 10, the analysis of the regression coefficients showed that highly cohesive (B = 0.184, t = 5.822, p < 0.001), collective efficacy (B = 0.337, t = 7.798, p < 0.001), and hidden profiles (B = - 0.278, t = - 8.140, p < 0.001) statistically significantly predict trust in groups. Due to the negative B value, hidden profiles are negatively correlated with trust. That means that if the value of hidden profiles increases (decreases) by 1 unit, the value of trust decreases (increases) by 0.278 units if the other predictors are held constant. Highly cohesive and collective efficacy are positively correlated with trust, due to the positive B value. That means that if the value of highly cohesive increases (decreases) by 1 unit, the value of trust also increases (decreases) by 0.184 units if the other predictors are held constant. Finally, if the value of collective efficacy increases (decreases) by 1 unit, the value of trust also increases (decreases) by 0.337 units, if the other predictors are held constant.

Table 10. Regression model for groupthink predictor trust

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics
Predictors	**B**	**S.E.**	**β**	**t**	**Sig.**	**VIF**
Constant	2.112	0.214		9.878	0.000*	
Highly cohesive	0.184	0.032	0.253	5.822	0.000*	1.593
Collective efficacy	0.337	0.043	0.356	7.798	0.000*	1.766
Hidden profiles	-0.278	0.034	-0.345	-8.140	0.000*	1.520

Note: P-values are denoted with: * for statistical significance at 0.1% level, respectively.
r = 0.795, r2 = 0.633, F = 178.518**

Source: Author's work

Since the values of all VIF factors in every multiple linear regression are less than 10, the problem of multicollinearity is not present. Since all the groupthink predictors statistically significantly correlate with each other, the first hypothesis was completely confirmed. Subject to the findings above, the second hypothesis that changing the value of one groupthink predictor affects the changing values in others is confirmed.

4. Discussion

Interaction between predictors, therefore, can be explained by multiple linear regressions performed between groupthink predictors. Correlation analysis observed that some predictors were positively correlated with other predictors, while others negatively. Therefore, they were divided into two groups.

Group 1 contains the positive predictors of groupthink. Those are high cohesiveness, collective efficacy, and trust, and they are positively correlated with each other. Positive predictors are desirable in groups because cohesiveness brings members together through bonds of attraction (Park, 1990), which enhances self-sacrifice and collaboration between members (Baptist, 2015). It also creates better communication among members, satisfaction, and higher levels of task accomplishments, yet decreases tension and anxiety (Yim and Park, 2021). Collective efficacy strengthens group performance (Whyte, 1998) because members remain together even when they encounter problems and put more effort into achieving the set goals (Bandura, 1997). Trust enhances synergistic thinking and collaborative thinking relationships (Manz and Neck, 1995), and is a prerequisite for team working and effective communication (Erdem, 2003).

They are only desirable up to the high and low tipping points where they can be harmful to a group's decision-making. Too much cohesiveness in the group strengthens the dominant opinion of the majority of the group (Abbott and Gilmour, 2010), and inhibits the individual efforts of any member who opposes the group's opinions (Baptist, 2015). The group will therefore reach a consensus too quickly (Kamalnath, 2017) and weaken reality testing because members in the group want to avoid contradictions between each other (Ahmadzadeh *et al.* 2022). On the other hand, Tarmo and Issa (2022) represent that low cohesive groups are not good at preventing groupthink either. High collective efficacy causes members to become overconfident (Whyte, 1998), so they make risky decisions (Janis, 1982), are overly optimistic, and ignore warnings (Moorhead *et al.* 1991). Because of this, workgroups may become obsessed with group superiority, leading to one way of thinking or groupthink (Yim and Park, 2021). Excessive trust inhibits diversity of viewpoints and causes members to self-censor (Erdem, 2003), as well as similarity, which is especially harmful in less innovative and less flexible organizations that are more prone to groupthink (Stazky and Davis, 2021) and have difficulty reading market changes (Yim and Park, 2021). Multiple linear regressions in this research found that low values of cohesiveness and collective efficacy may predict that there is promotional leadership in the group, and low values of trust may indicate that the group has hidden profiles.

Group 2 contains negative groupthink predictors. These are promotional leadership, conformity, concurrence seeking, anxiety, and hidden profiles, and they are positively correlated with each other. The aim is to reduce the value of these predictors. If the group has a directive leader, or if the value of promotional leadership is high, the opinions of other members are not considered, and therefore fewer alternative ideas are formed (Flowers, 1977), which undermines the creativity of collective thinking (Yim and Park, 2021). Conformity causes group members to start self-censoring and questioning their beliefs, so they do not express all their concerns about the group's decision (Baptist, 2015). A high value of concurrence seeking also causes each member to express less criticism of the group's opinion than he or she would normally do, because a member is under pressure not to oppose the idea of a majority in the group (Henningsen *et al.* 2006), and because other members disrespect their opinions (Yim and Park, 2021), therefore, they only share information that is consistent with group values (Jansen and Searle, 2021). This is also confirmed by Brennan (2022), who states that a high agreement value and a low disagreement value between members in a group cause groupthink. Excessive anxiety in group members cause them to band together around one decision option (Janis and Mann,

1977) and ignore information that predicts poor decision outcomes (Abbott and Gilmour, 2010), and may cause excessive caution or panic among members (Janis and Mann, 1977). Having a lot of hidden profiles in the group causes groups not to have the possibility to view all the alternative choices, because of a given priority to known information which, therefore, affects the decision of the group (Henningsen *et al.* 2006).

On the contrary, a lack of promotional leadership can lead to longer decision-making and a higher level of indecision. Janis and Mann (1977) explain that information overload causes more confusion, consumes time and money, and increases the likelihood of releasing the most important information. A participative leadership style definitely results in more information overload. According to Moorhead *et al*. (1991), it is also important for groups to have a strong and demanding leader, who demands critical judgment and consideration of all decision options, so a laissez-faire leadership style or a completely uninterested participatory leader is not effective at preventing groupthink, because a leader who is more concerned with decision-making will more easily prevent it (Sunstein and Hastie, 2015). This is also supported by Grube and Killick (2021), who argue that the best leader is not one who is more dominant and willing to accept other points of view, as this leads to groupthink, whereas being less dominant and unwilling to accept other points of view leads to polythink. They add to this that, as we mentioned above, a less dominant leader who is willing to accept other points of view is ineffective in making decisions. The best leader is one who is dominant on the one hand, while also willing to accept different points of view and opinions on the other. A lower value of the directive leadership style, as found by multiple linear regression in our research, may also predict a higher value of cohesiveness and collective efficacy, which is not great in the case of groupthink. Lack of conformity and concurrence seeking can lead to polythink and the negative consequences associated with this opposing phenomenon to groupthink, such as an increased likelihood of intragroup conflicts, confusion, and lack of communication among members, or the decision not to be made (Mintz and Wayne, 2016). Brennan (2022) refers to them as dysfunctional decision-making groups if members have a high disagreement value, and static decision-making groups if members have a high agreement and disagreement value. Multiple linear regression in our research revealed that decreasing the value of conformity also decreases the value of promotional leadership, which in turn can predict a higher value of cohesiveness and collective efficacy. Multiple linear regression also revealed that a lower value of concurrence seeking could predict a higher value of collective efficacy. Group members' lack of anxiety causes them to ignore potential negative consequences later on (Janis and Mann, 1977). That may predict a lower value of promotional leadership, as found with multiple linear regression in our research, which in turn can predict a higher value of cohesiveness and collective efficacy. That is consistent with Yim and Park (2021), who claim that high cohesiveness reduces anxiety, which we did not find in our research because predictor highly cohesive had no significant effect on predictor anxiety directly, and predictor anxiety had no significant effect on predictor high cohesive directly. Lack of hidden profiles or information overload could extend decision-making time, so known information is preferred in decision-making (Kerr and Tindale, 2004). Findings of multiple linear regression in our research show that the lower value of hidden profiles could also lead to excessive trust among members.

Because of the problems mentioned above, it is important to maintain a moderate value of groupthink predictors, not low or high, in order to avoid the occurrence of groupthink in groups. Interaction between groupthink predictors found through the methodology used in our research can explain the movement of predictor values in a positive and negative direction. Consequently, that could help with maintaining their moderate values.

5. Conclusion

The discovery of groupthink in Slovenian working groups suggests that this phenomenon should be studied further. To a large extent, it is the responsibility of the team leaders to observe and deal with them. They should learn techniques to prevent the occurrence of groupthink. The research paper presents one of these techniques, but since groupthink is a replicated phenomenon with the emergence of new decision-making, the search for the right recipe to prevent groupthink from occurring continues. This can be an opportunity for future research.

Because Baptist (2015) did not include all of the antecedents from the original theory in his questionnaire, such as group isolation, we did not include them in our research either. Researchers in the future could incorporate those antecedents into correlation and causal effect analyses.

Although the research revealed some statistically significant facts that could help organizations avoid groupthink in decision-making, some obstacles emerged that could easily skew the results. The first of these limitations is that the questionnaire was completed online. Since there was no real control over how it was filled out, the answers could easily be untrue in some cases. The data could also be untrue due to social desirability bias in filling out the questionnaire - when respondents know what socially desirable behavior is, they answer tricky questions by giving a higher value for a socially acceptable fact on the one hand and a lower value for a socially unacceptable fact on the other (Krumpal, 2013). Respondents were also warned at the beginning of the survey that they should give their answers based on the situation in which their working group made a bad decision. In some cases, respondents might have judged the current state of the working group, which could also explain the possible untruthfulness of the answers. Future researchers should therefore have more control over the survey responses than we had.

Although the purpose of the survey was to include staff from different organizations and thus increase the representativeness of the sample, the respondents and their answers were taken from a smaller number of different organizations because of the many refusals to participate. In addition, there are many different work groups, such as groups of decision makers, managers, administrators and work groups, where the differences in decision making may lead to different results as found in this research. It would be necessary to break down the types of working groups further and only then compare them and identify the differences.

Because groupthink must be prevented before it occurs, group leaders can use our methodological approach to facilitate control over the movement of values and maintain a moderate value of the predictors. So, organizations and working groups need to focus on predictors rather than groupthink itself. However, because both sides, group leaders and other group employees, are required to create the phenomenon, they can only prevent it entirely by repeatedly warning each other about the potentially harmful effects of groupthink. That could help the organization and working group to make better decisions that positively impact their business, as well as their existence.

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