Background – Shared cognition in teams

- ## Two overall questions (and some specific)

  - Does leaders and members differ when they assess their teams maturity in terms of GDQ scale 1 to 4? (are leaders more optimistic?)

  - If there is a gap between leaders and members, does it become smaller in the higher stages? (more shared cognition)

Background – Shared cognition in teams

- Master's thesis focusing on organizational psychology, group psychology and assessment/decision-making
- The aim was to understand what influences assessments in the GDQ
- The questions were based on **(1)** a need to know more, as questions of this kind are frequently asked of, among other things, consultants and **(2)** that the literature has not yet caught up
- Based on a theoretical framework **about shared cognition**, hypotheses were set up that hoped to be able to answer one of the following...

1. Do leaders and followers make different assessments in the GDQ?
2. Are leaders and followers differently congruent in relation to their own group's average score when answering the GDQ?
3. Do the patterns look the same in the different maturation phases?
4. Does the maturity level of the group affect the congruence in assessment?

Respondents and statistical analyzes

- GDQ data collected between 2008-2018
- Respondents from **23 countries** who answered the GDQ in three languages, English (84%), Norwegian (8%) and Swedish (8%)
- **486 teams** with an average group size of 8.17 individuals including the leader
- **3970 respondents**, 3484 followers and 486 leaders
- 51.6% men and 48.4% women

- Three different types of statistical analyzes were carried out
- **(1)** In the first analysis, leaders and followers were compared in how they answered the GDQ
- **(2)** The second analysis was to investigate the relationship between the group's mean score in the different GDQ scales and the difference between leader and group
- **(3)** In the third and final analysis, the regression analysis method was used to investigate which factors influence congruence in the assessment of the GDQ

Analysis 1 – Group comparisons

- In the first analysis, four different tests were carried out where leaders and followers were compared at group level
- Test 1 examined the difference in initial assessment where leaders and followers had to estimate how they estimated their own group's status according to the GDQ
- Test 2 examined differences between leaders and followers in GDQ Scale 1–4

- Test 3 examined whether there was a difference between leaders/followers in relation to their own group
- Test 4 replicated Tests 1–3 but with the difference that leaders/followers from groups within the same phase were compared with each other, the aim was to investigate whether firm affiliation can be important
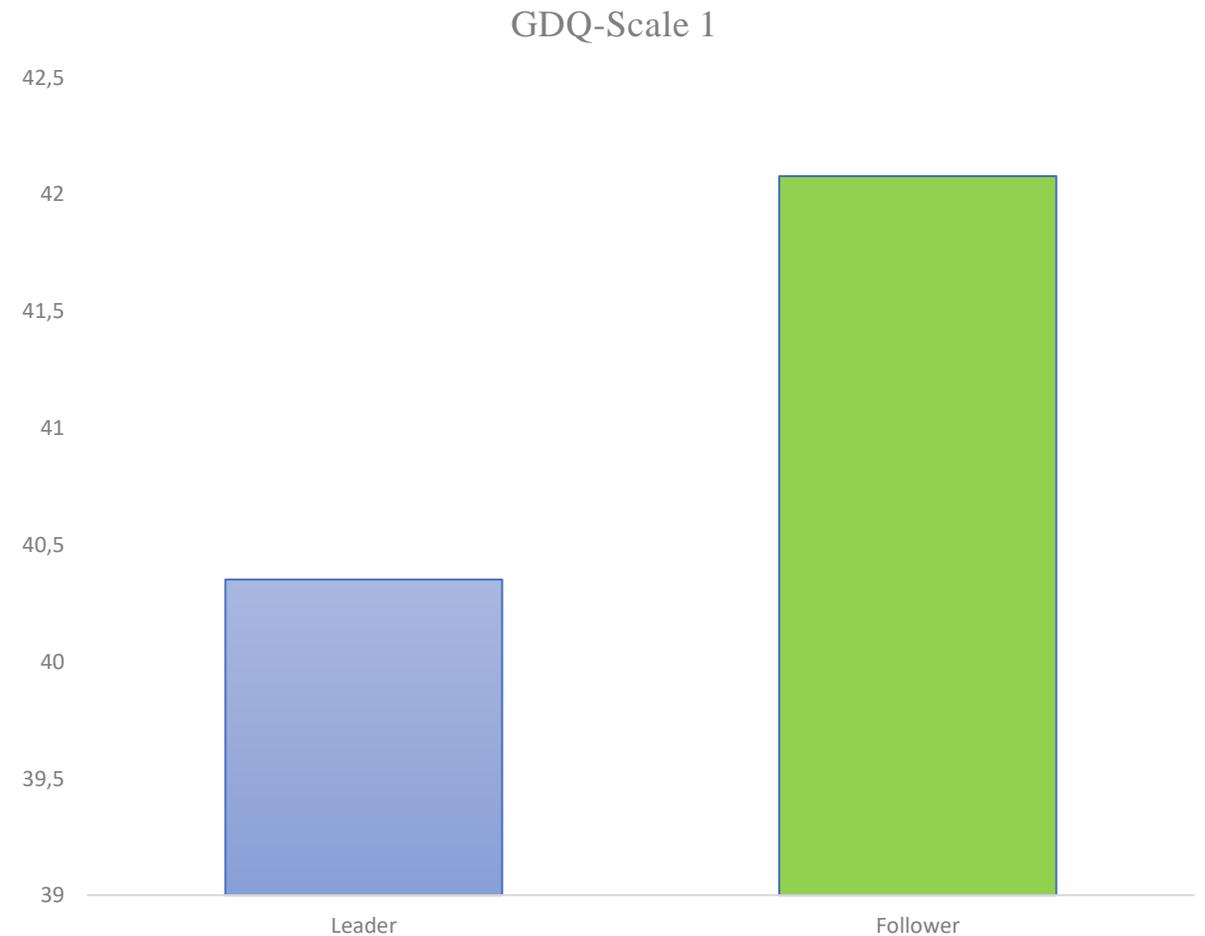
- In the first test, it was compared whether leaders and followers differed in initial assessment
- Leaders and followers had an average deviation of approx. 1 point, which meant that on average one assessed their own group's status as a step higher or lower on the GDQ

- There was no significant difference between leaders (M = 1, sd = 0.88) and followers (M = 0.98, sd = 0.88), T (3968) = 0.41, p = 0.69

- In the first test, the results of leaders and followers were compared in all scales
- This comparison was not put in relation to the own work group but was about the differences between leaders and followers as a whole
- Leaders and followers differed significantly in all scales on the GDQ

- In GDQ scale 1, the difference between leaders (M = 40.34, s = 6.62) and followers (M = 42.08, s = 6.37) was significant, T (3968) = -5.57, p = <.001

GDQ-Scale 1

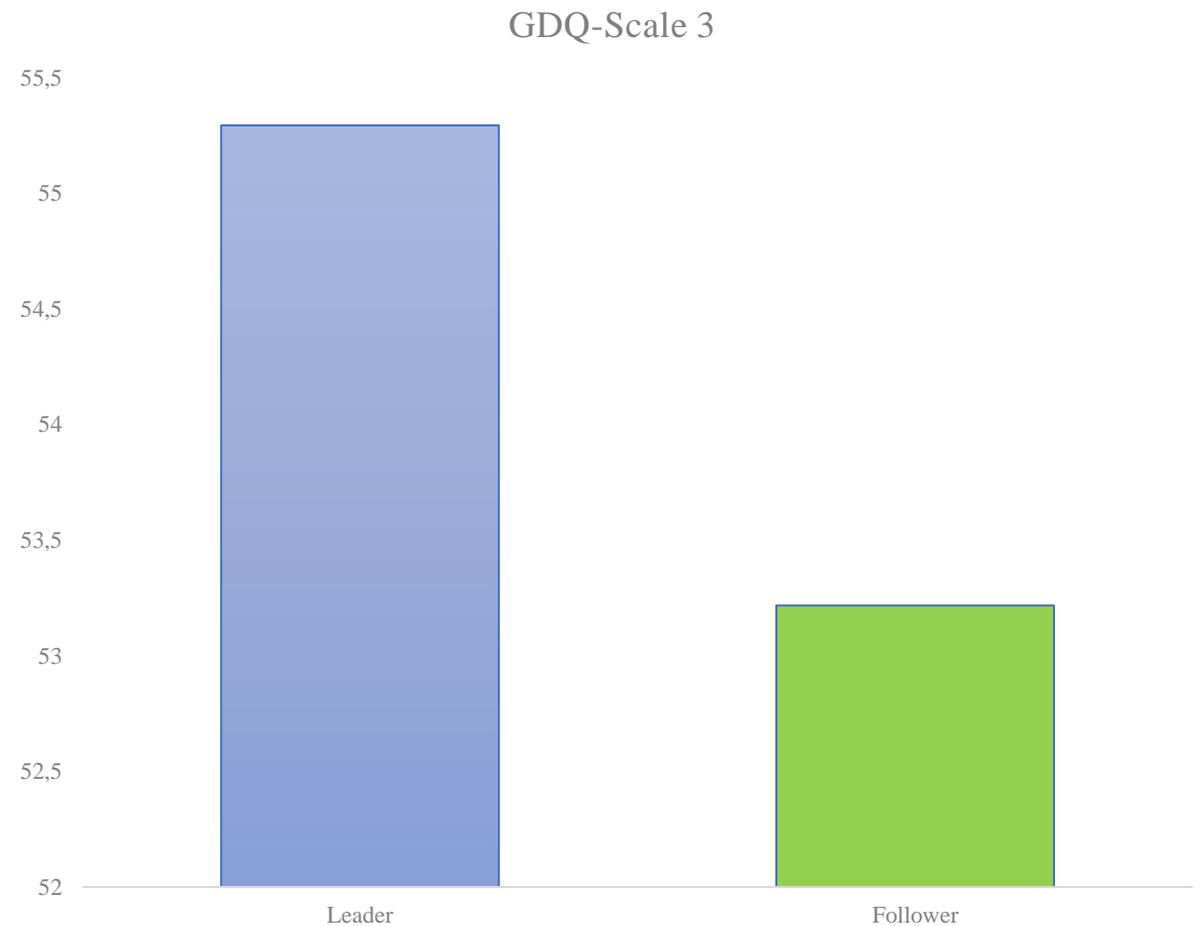- In GDQ scale 2, the difference between leaders (M = 36.46, s = 9.29) and followers (M = 37.97, s = 9.5) was significant, T (3968) = -3.27, p = 0.001

GDQ-Scale 2

- In GDQ scale 3, the difference between leaders (M = 55.29, s = 7.3) and followers (M = 53.21, s = 8.05) was significant, T (3968) = 5.39, p = <.001

GDQ-Scale 3

- In GDQ scale 4, the difference between leaders (M = 58.56, s = 7.46) and followers (M = 55.35, s = 8.49) was significant, T (3968) = 7.92, p = <.001
- Summary: In GDQ scale 1 & 2, the followers had a higher mean value, while the leader's mean value was significantly higher than the follower's in GDQ scale 3 & 4
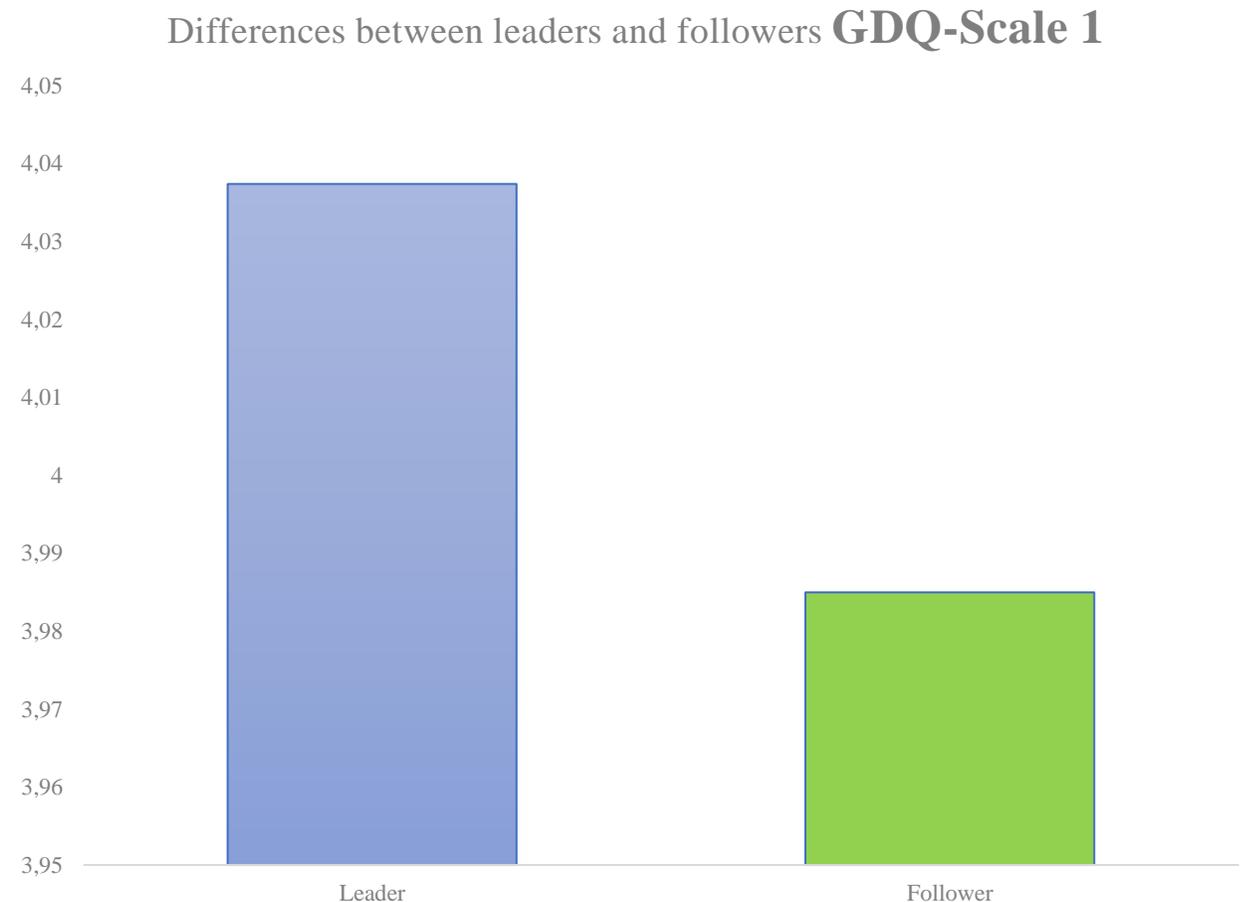

GDQ-Scale 4

- In the third test, just like the previous test, the assessment of leaders and followers in the GDQ scales 1–4 were compared with the difference that the assessment of leaders and followers in relation to their own group, i.e. that each individual was compared against the average score of their own group
- Furthermore, each individual's total deviation was also compared to the average value of their own group

- There were significant differences in 3/5 comparisons
- There were differences o scale 2 & 3 as well as in the "total" comparison
- In all cases where there were differences, leaders made judgments that were more congruent with the group as a whole than the average group member made
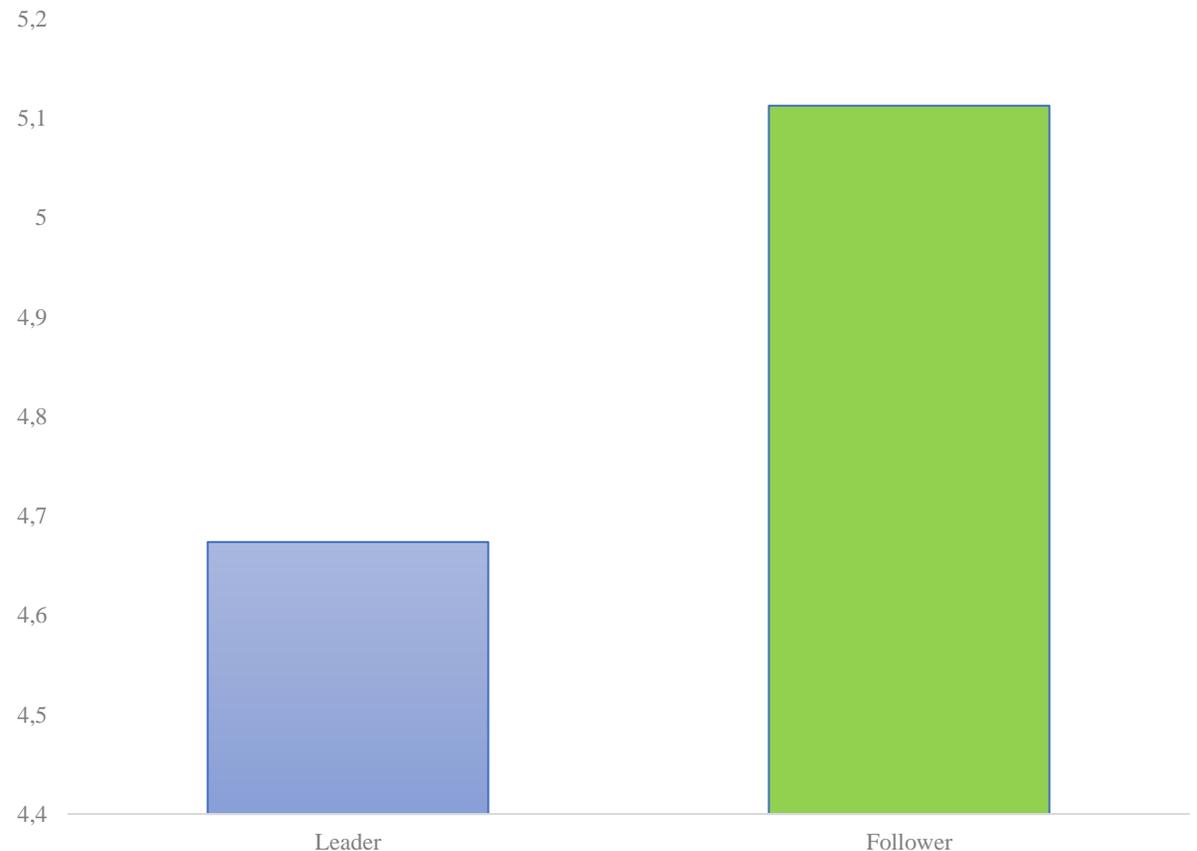
- In GDQ scale 1, the difference in deviation from the group mean between leaders (M = 4.04, s = 3.10) and followers (M = 3.99, s = 3.13) was not significant, $T(3968) = 0.35$, $p = 0.73$

Differences between leaders and followers **GDQ-Scale 1**

- In GDQ scale 2, the difference in deviation from the group mean between leaders (M = 4.68, s = 3.69) and followers (M = 5.11, s = 4.10) was significant, T (3968) = -2.24, p = 0.025

Differences between leaders and followers **GDQ-Scale 2**

- In GDQ scale 3, the difference in deviation from the group mean between leaders (M = 4.25, s = 3.23) and followers (M = 4.82, s = 3.81) was significant, T (3968) = -3.19, p = 0.001
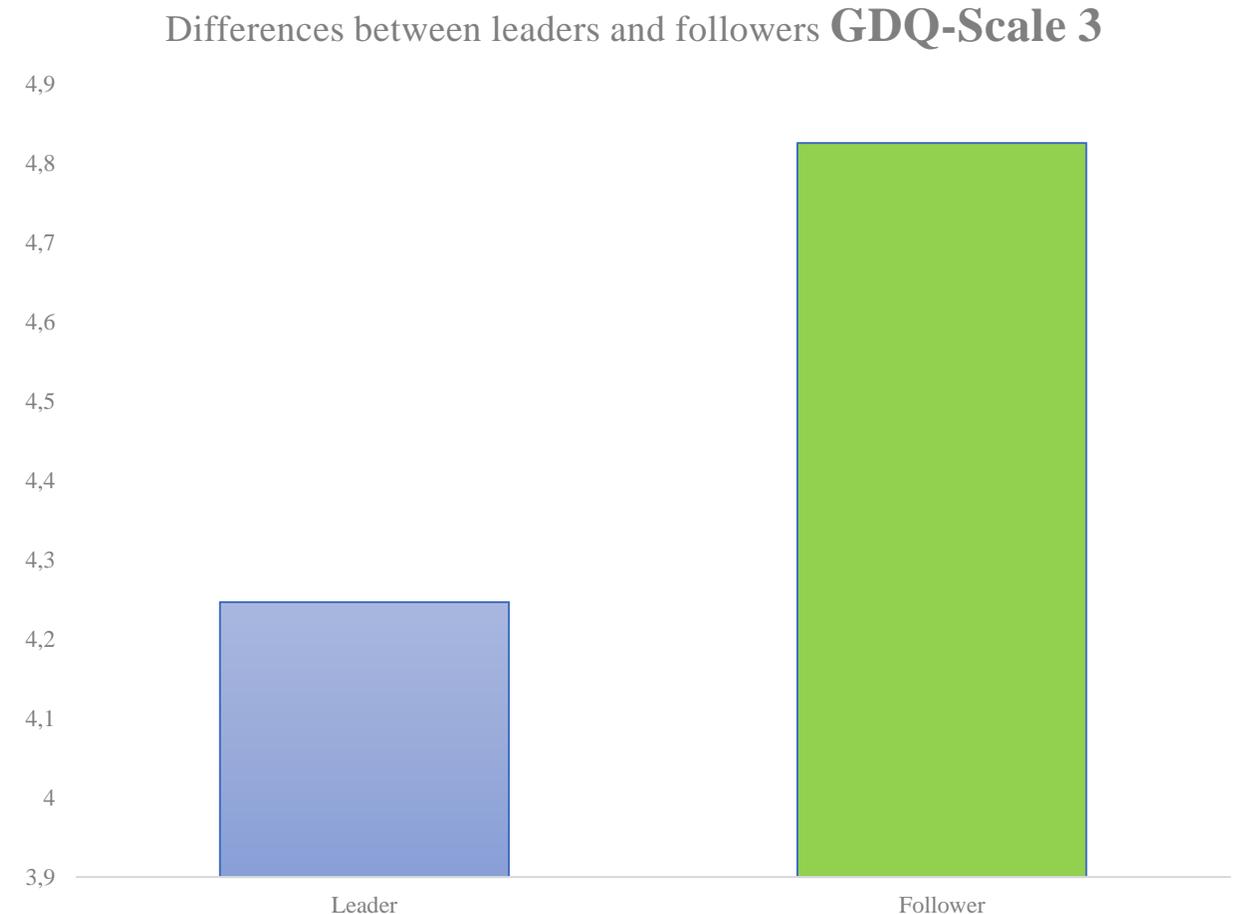
Differences between leaders and followers **GDQ-Scale 3**

- In GDQ scale 4, the difference in deviation from the group mean between leaders (M = 4.93, s = 3.73) and followers (M = 5.24, s = 4.11) was not significant, T (3968) = -1.59, p = 0.113

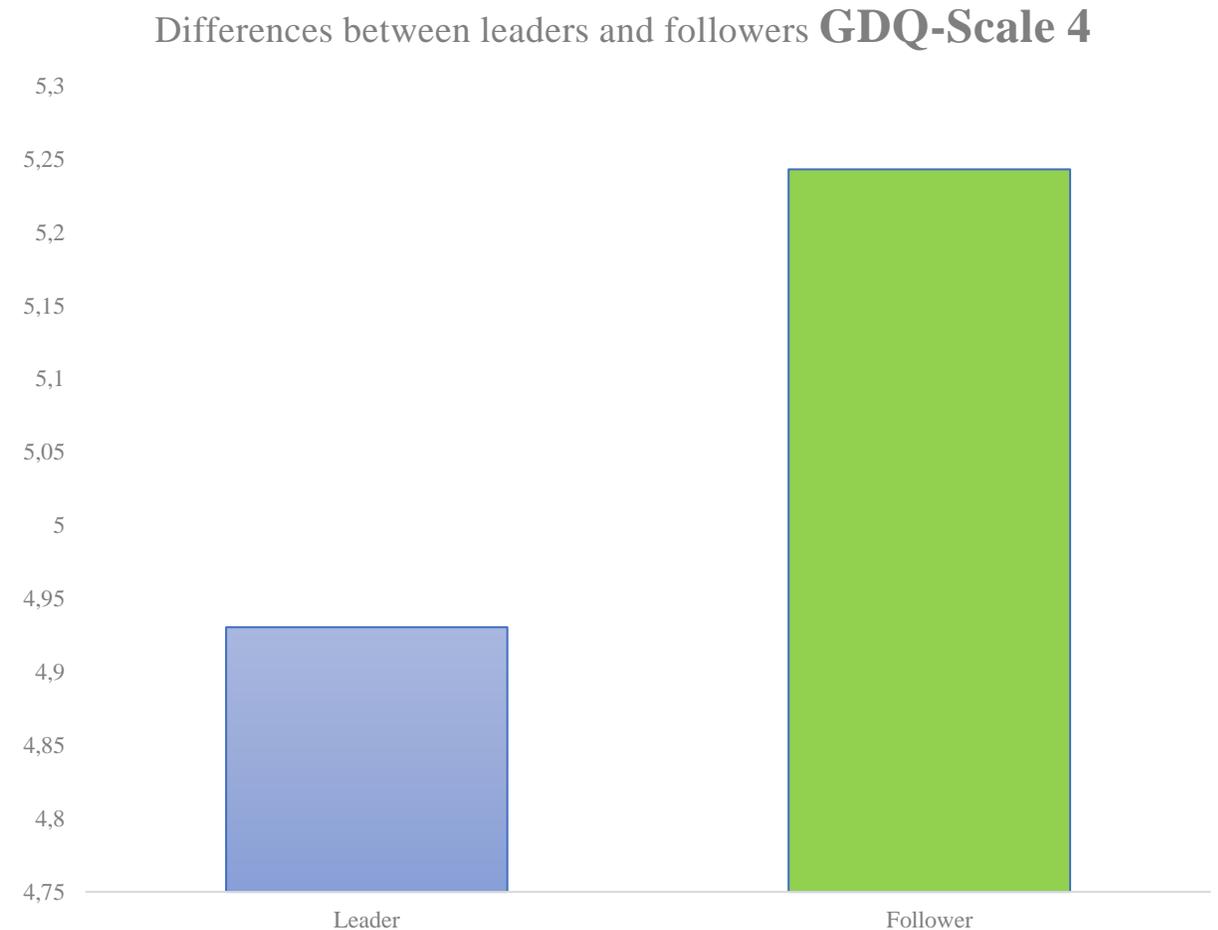Differences between leaders and followers **GDQ-Scale 4**

● **The total difference in deviation** from the group mean between leaders (M = 4.48, s = 2.49) and followers (M = 4.8, s = 2.7) in all GDQ scales (1–4) was significant, T (3968) = -2.47, p = 0.014

Differences between leaders and followers **GDQ-Scale 1-2-3-4**
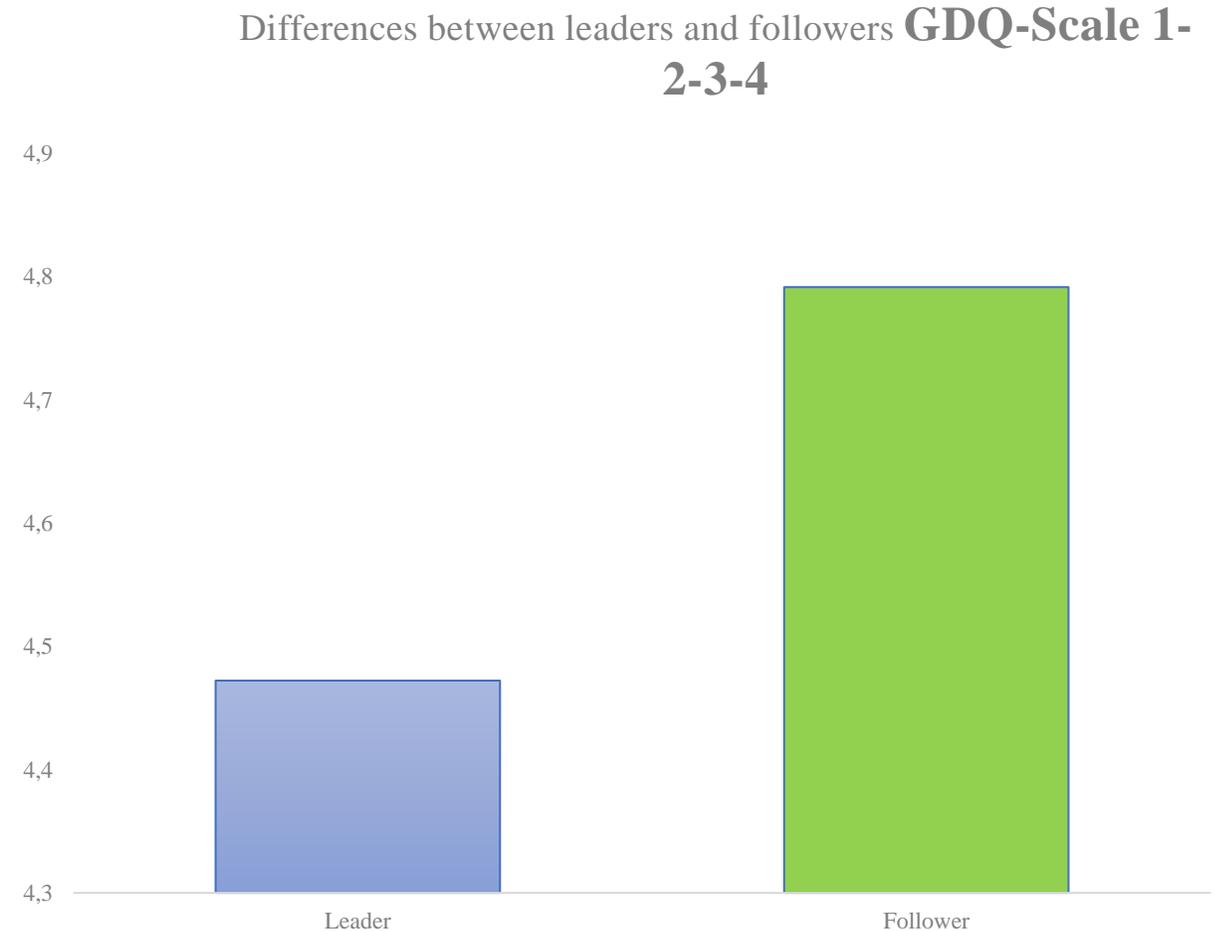
Analysis 1: Correlations 1/4

- The first statistical analysis investigated whether there was a correlation between the group's overall assessment and the difference between the leader and the own group
- A total of 486 groups were investigated
- In 3/4 scales there were significant correlations
- In QDQ-Scale 1 there was no significant correlation

- In GDQ-Scale 2, the correlation was significant as r (486) = 0.18, p = <.001, which means that the difference between leaders and followers increases the higher the group's value in the current scale

- In GDQ-Scale 3, the correlation was significant as r (486) = - 0.13, p = <.001, which means that the difference between leaders and followers decreases the higher the group's value in the current scale

- In GDQ-Scale 4, the correlation was significant as r (486) = - 0.2, p = <.001, which means that the difference between leaders and followers decreases the higher the group's value in the current scale
- Summary: There is support that a higher mean value for the group in Scale 2 has a connection with a lower degree of congruence in assessment, the opposite can be said about the connections in Scale 3 & 4
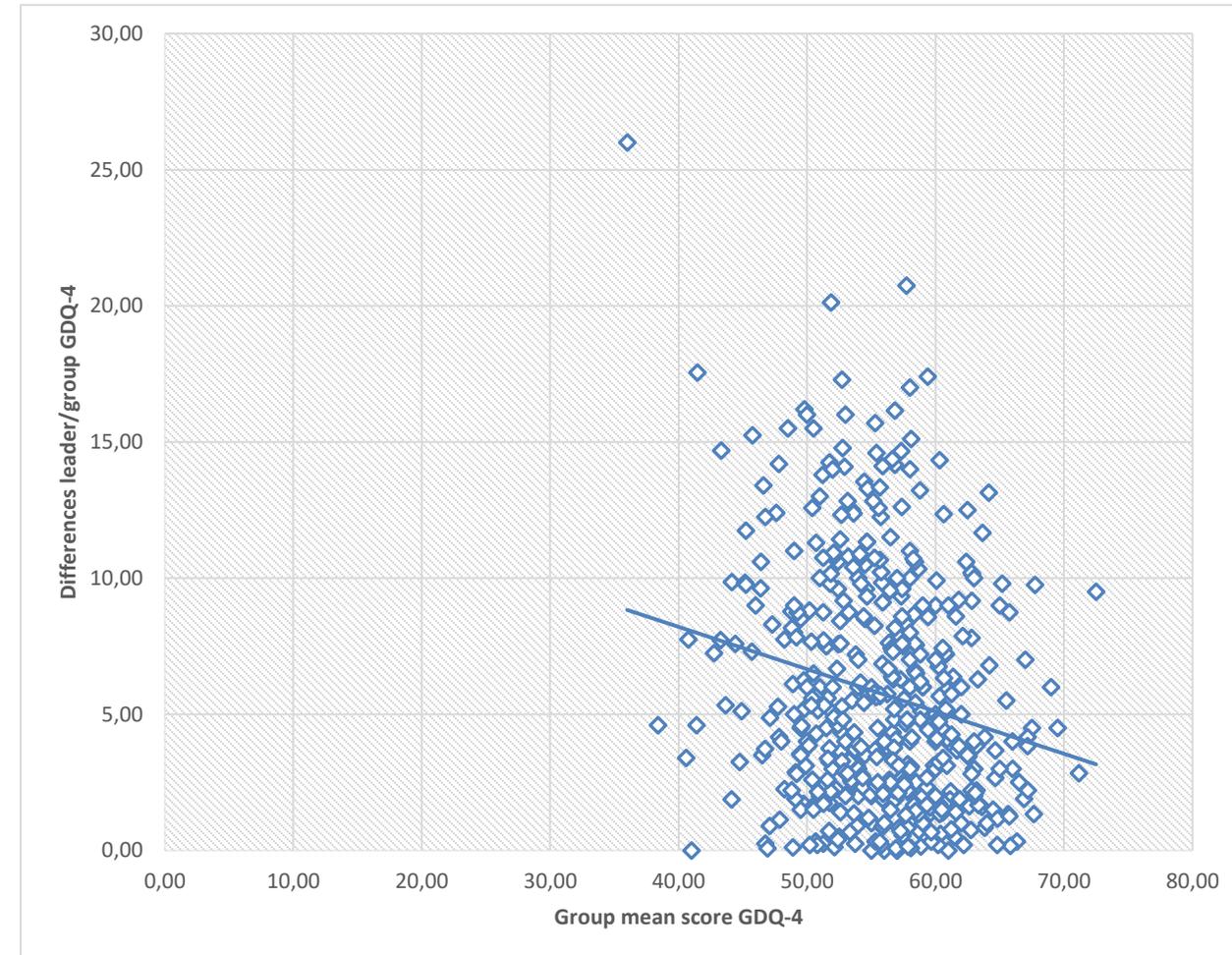
- In the fourth test, Test-1, 2 and 3 were replicated
- The method was the same as in the previous tests but with the difference that leaders and followers from groups with the same status in maturity level were compared
- That is, leaders and followers from Phase 1 groups were compared with each other but not with leaders and followers from the other three group categories

- A total of 10 comparisons were carried out for each development phase, resulting in 40 unique comparisons

Analysis 3: Regression analysis

- In order to further investigate whether an individual is a leader or a follower affects deviations in assessment in relation to their own group's average value, a regression analysis was carried out
- A total of seven independent variables were included in the model
- Whether one was a leader or a follower had no influence
- The factors that were significant were group size, the group's maturity level, time in the organization and level of education

- (1) Whether one is a leader/follower
- (2) Own group size
- (3) The own group's maturity level
- (4) Gender of the respondent
- (5) Age
- (6) Level of education of respondent
- (7) Time within the organization

Analysis 3: Regression analysis

- In the first analysis, a multiple linear regression analysis was used to predict the deviation in assessment against the own group in GDQ - scale 1
- A significant regression equation was obtained when $F_{(7, 3962)} = 2.452$, $p = 0.17$ with an adjusted R^2 of 0.03
- The factor group size, $t_{(3962)} = 2.76$, $p = 0.006$ with beta value (0.037) indicates a positive relationship between the size of the own group and deviation in the assessment of the own group in GDQ scale 1
- The factor education level $t_{(3962)} = -2.12$, $p = 0.034$ with beta value (-0.077) indicates a negative relationship between education level and deviation in the assessment of one's own group in GDQ scale 1

Education level

Time in organization

Group size

-0,077 *

+0,037 **

Difference in assessment on the GDQ in relation to one's own group

Leader/Follower

Age

GDQ - Scale 1

Gender

Team maturity
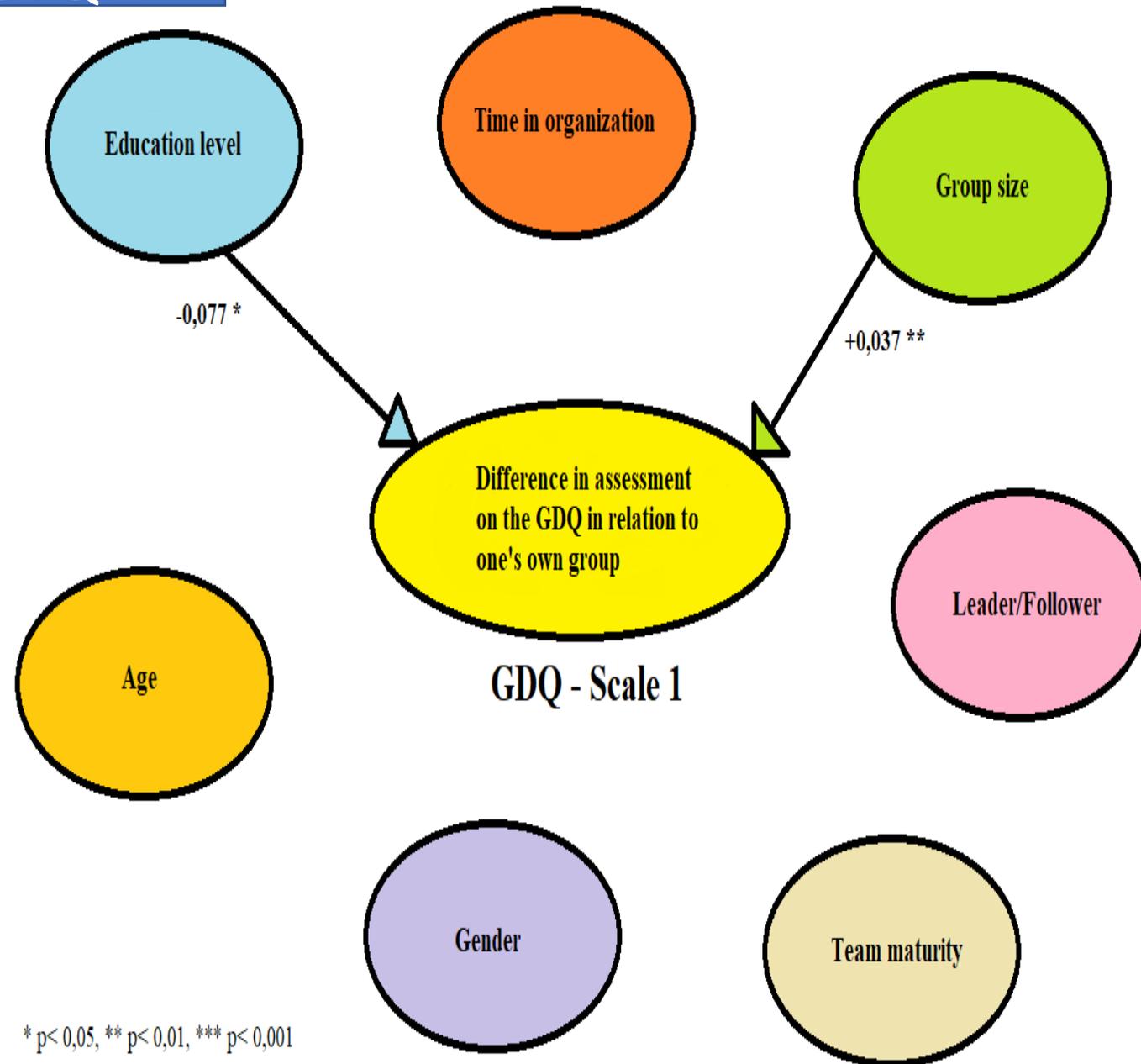
* p< 0,05, ** p< 0,01, *** p< 0,001

Analysis 3: Regression analysis

- In the second analysis, a multiple linear regression analysis was used to predict the deviation in assessment against the own group in GDQ scale - 2
- A significant regression equation was obtained when $F_{(7, 3962)} = 12.65$, $p = <.001$ with an adjusted R^2 of 0.02
- The factor own group size, $t_{(3962)} = 5.07$, $p = <.001$ with beta value (0.082) indicates a positive relationship between the size of the own group and deviation in the assessment of the own group in GDQ scale 2
- The factor group maturity level, $t_{(3962)} = -4.77$, $p = <.001$ with beta value (-0.076) indicates a negative relationship between the maturity level of the own group and deviation in the assessment of the own group in the GDQ- scale 2
- The factor education level $t_{(3962)} = -4.3$, $p = <.001$ with beta value (-0.069) indicates a negative relationship between education level and deviation in the assessment of one's own group in GDQ scale 2
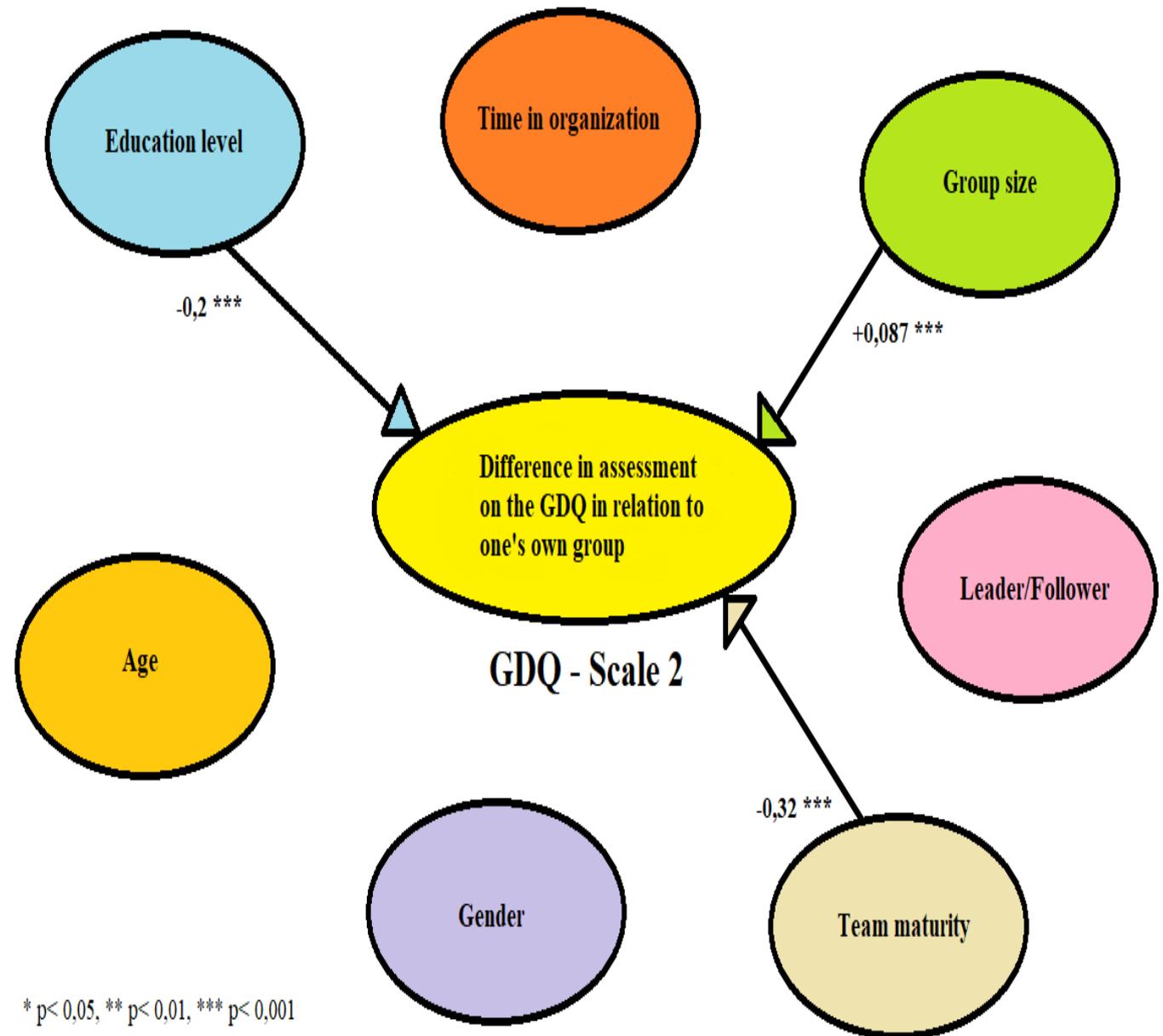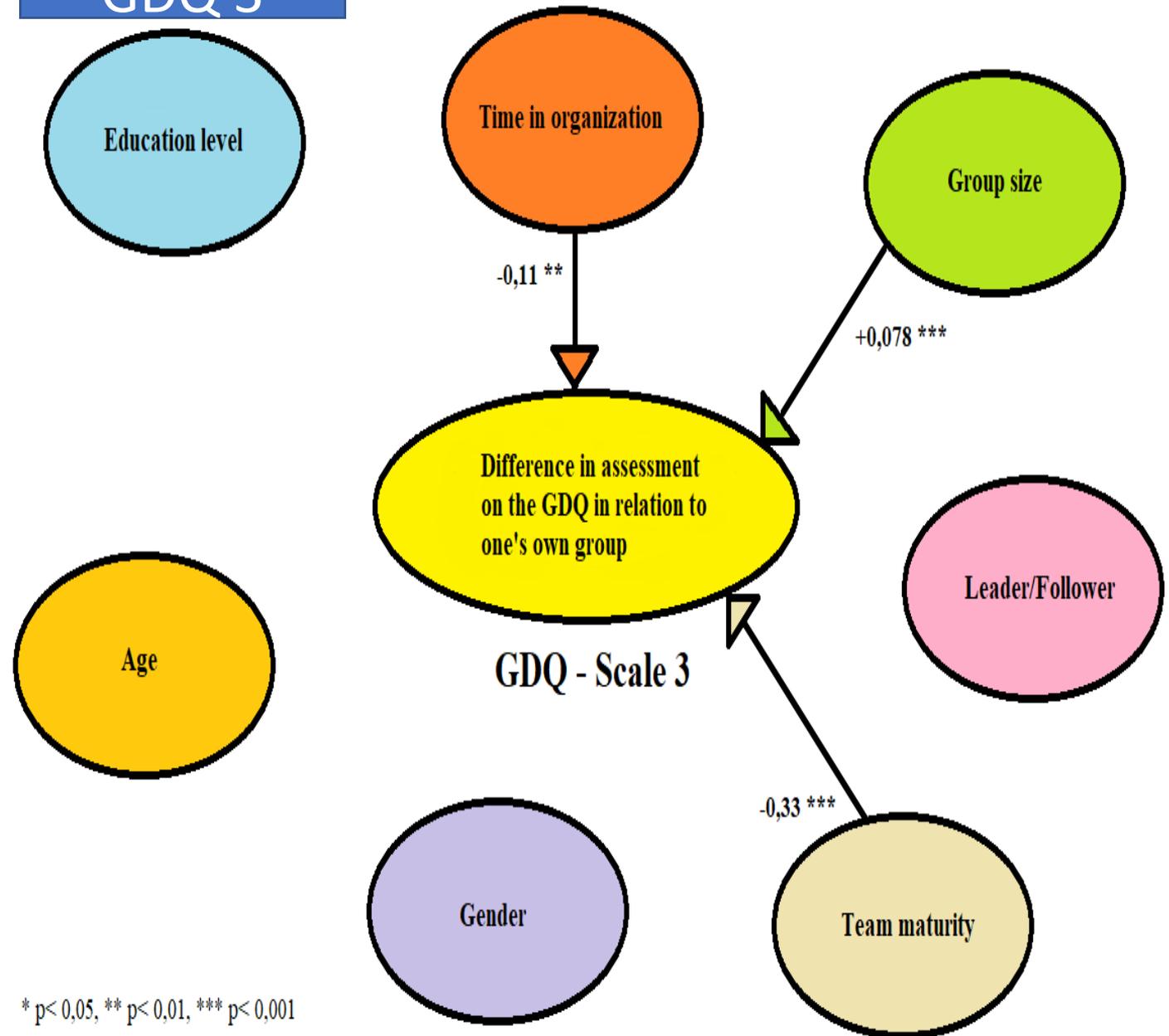- The factor time within the organization, $t_{(3962)} = -2.44$, $p = 0.015$ with beta value (-0.042) indicates a negative relationship between time in the organization and deviation in the assessment of one's own group in GDQ scale 2

GDQ 2

Education level

Time in organization

Group size

-0,2 ***

+0,087 ***

Age

Difference in assessment on the GDQ in relation to one's own group

GDQ - Scale 2

Leader/Follower

Gender

-0,32 ***

Team maturity

* p< 0,05, ** p< 0,01, *** p< 0,001

Analysis 3: Regression analysis

- In the third analysis, a multiple linear regression analysis was used to predict the deviation in assessment against the own group in GDQ - scale 3
- A significant regression equation was obtained when $F_{(7, 3962)} = 12.69$, $p = <.001$ with an adjusted R^2 of 0.02
- The factor group size, $t_{(3962)} = 4.95$, $p = <.001$ with beta value (0.08) indicates a positive relationship between the size of the own group and deviation in the assessment of the own group in the GDQ- scale 3
- The factor group maturity level, $t_{(3962)} = -5.35$, $p = <.001$ with beta value (-0.086) indicates a negative relationship between the maturity level of the own group and deviation in the assessment of the own group in the GDQ- scale 3
- The factor time within the organization, $t_{(3962)} = -2.94$, $p = 0.003$ with beta value (-0.051) indicates a negative relationship between time in the organization and deviation in the assessment of one's own group in GDQ scale 3

GDQ 3

Education level

Time in organization

Group size

-0,11 **

+0,078 ***

Difference in assessment on the GDQ in relation to one's own group

GDQ - Scale 3

Leader/Follower

Age

-0,33 ***

Gender

Team maturity

* p< 0,05, ** p< 0,01, *** p< 0,001

Analysis 3: Regression analysis

- In the fourth analysis, a multiple linear regression analysis was used to predict the deviation in assessment against the own group in GDQ - scale 4
- A significant regression equation was obtained when F (7, 3962) = 12.41, p = <.001 with an adjusted R2 of 0.02
- The factor group size, t (3962) = 4.39, p = <.001 with beta value (0.075) indicates a positive relationship between the size of the own group and deviation in the assessment of the own group in GDQ - scale 4
- The factor group maturity level, t (3962) = -6.4, p = <.001 with beta value (-0.103) indicates a negative relationship between the own group's maturity level and deviation in the assessment of the own group in the GDQ- scale 4
- he factor time within the organization, t (3962) = -2.09, p = 0.004 with beta value (-0.036) indicates a negative relationship between time in the organization and deviation in the assessment of one's own group in GDQ scale 4
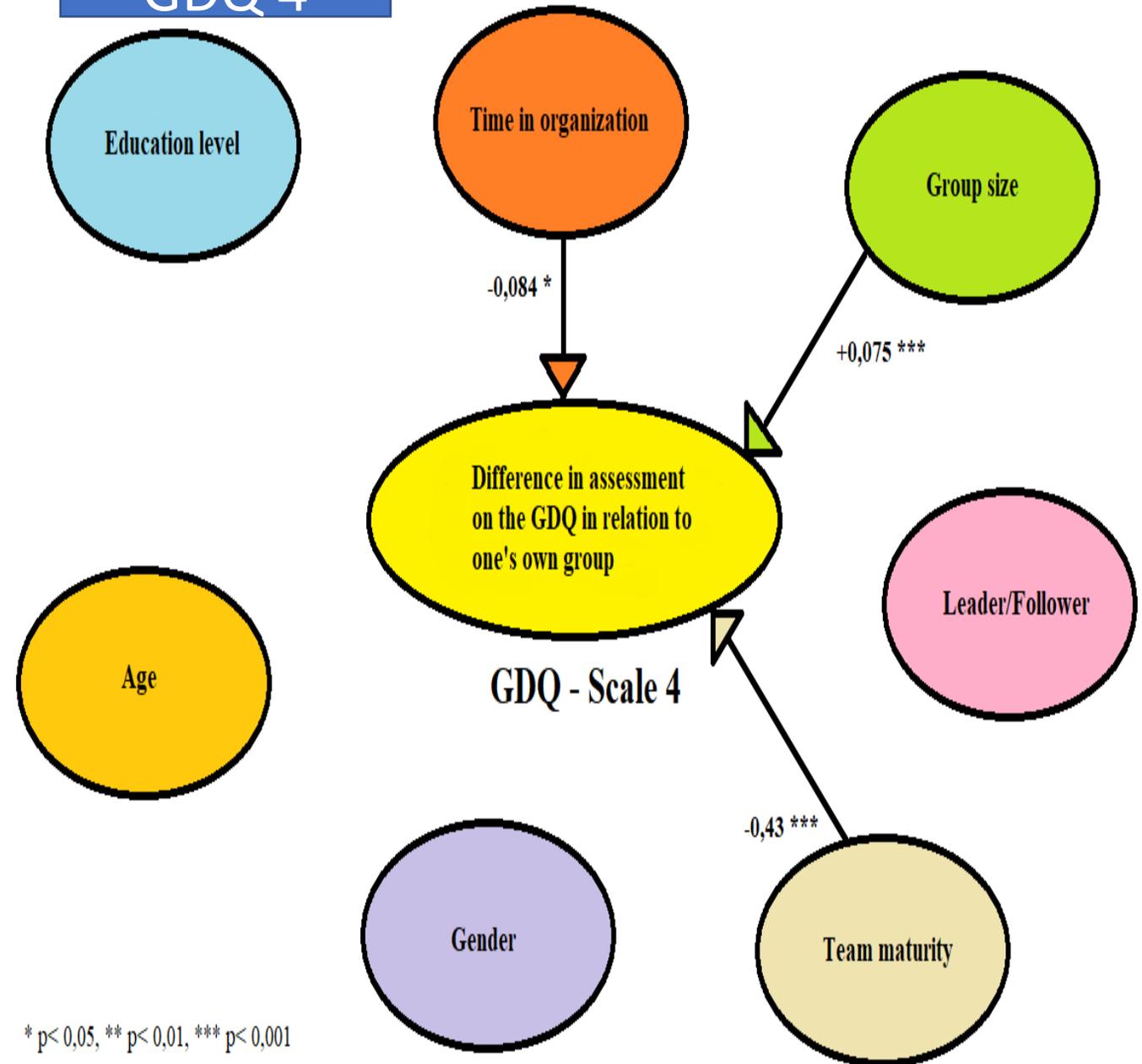
GDQ 4

Education level

Time in organization

Group size

-0,084 *

+0,075 ***

Difference in assessment on the GDQ in relation to one's own group

Leader/Follower

Age

GDQ - Scale 4

Gender

-0,43 ***

Team maturity

* p< 0,05, ** p< 0,01, *** p< 0,001

Analysis 3: Regression analysis

- In the fift and final analysis, a multiple linear regression analysis was used to predict the total deviation in assessment against the own group in GDQ - scale 1-2-3-4
- A significant regression equation was obtained when $F_{(7, 3962)} = 16.43$, $p = <.001$ with an adjusted R^2 of 0.026
- The factor group size, $t_{(3962)} = 6.15$, $p = <.001$ with beta value (0.099) indicates a positive relationship between the size of the own group and deviation in the assessment of the own group in GDQ scale 1 -2-3-4
- The factor group maturity level, $t_{(3962)} = -6.28$, $p = <.001$ with beta value (-0.1) indicates a negative relationship between the own group's maturity level and deviation in the assessment of the own group in GDQ scale 1-2-3-4
- The factor education level $t_{(3962)} = -2.65$, $p = 0.008$ with beta value (-0.043) indicates a negative relationship between education level and deviation in the assessment of one's own group in the GDQ scale 1-2-3- 4
- The factor time within the organization, $t_{(3962)} = -2.47$, $p = 0.013$ with beta value (-0.042) indicates a negative relationship between time in the organization and deviation in the assessment of one's own group in GDQ scale 1 -2-3-4
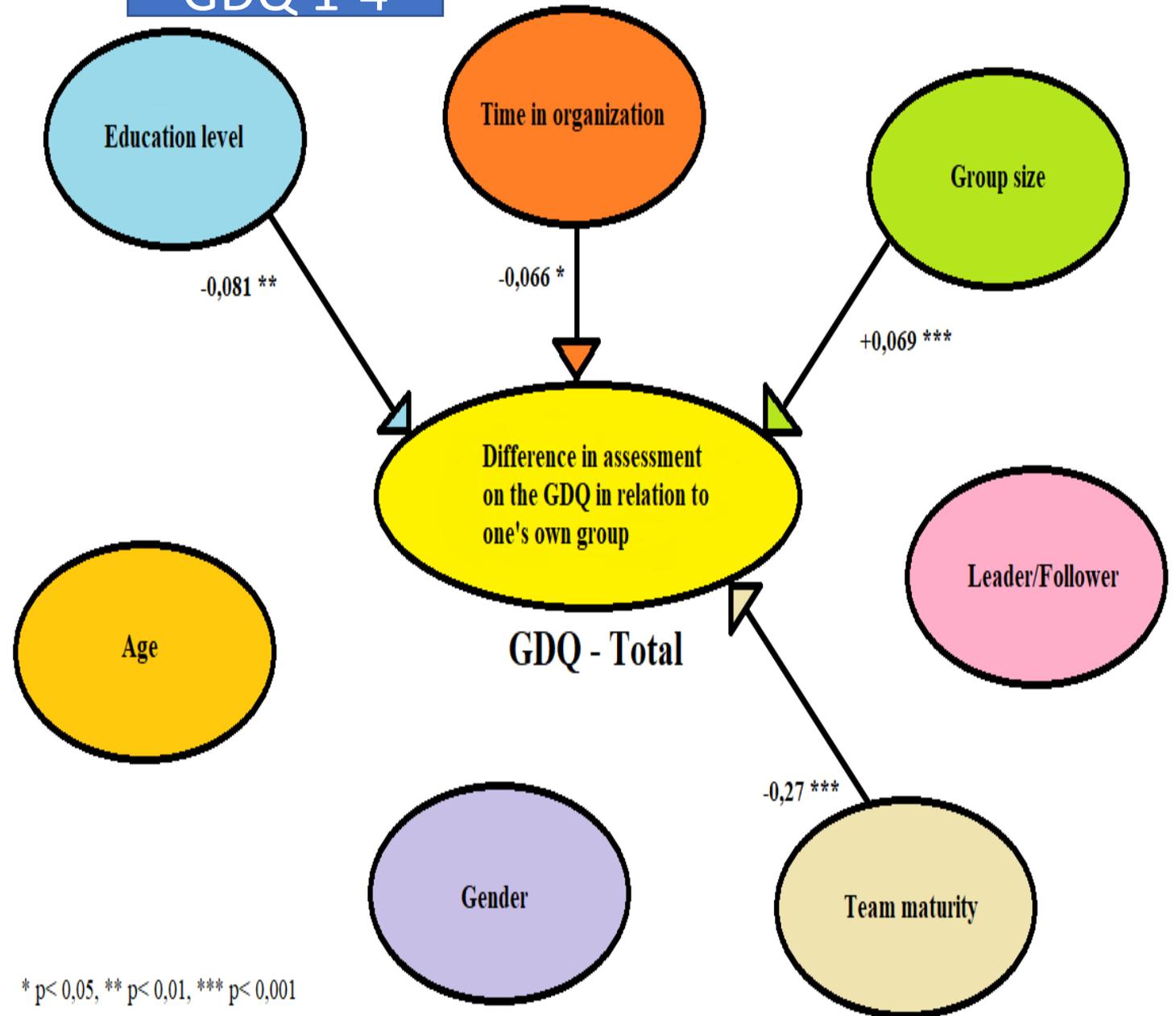
Education level

Time in organization

Group size

-0,081 **

-0,066 *

+0,069 ***

Difference in assessment on the GDQ in relation to one's own group

GDQ - Total

Age

Leader/Follower

-0,27 ***

Gender

Team maturity

* p< 0,05, ** p< 0,01, *** p< 0,001

Conclusion – Answering initial questions 1/2

- (1) Do leaders and followers make different judgments in the GDQ?

The results from the analyzes indicate that leaders and followers differ significantly in the assessment of GDQ, for example leaders tend to be significantly lower in scale 1 & 2 but also significantly higher in scale 3 & 4

- (2) Are leaders and followers differently congruent in relation to their own group's score value when answering the GDQ?

In cases where there is a difference between leader and follower, **leaders seem on average to make judgments that are more congruent than the average group member**. When you control for other factors such as education level, time in the organization, group size and the maturity of your own group, the effect of leadership also disappears.

- (3) Does the stages of the group affect the congruence in assessment and what does any effect look like?

In the regression analyses, the factor maturity level was the one that also had the strongest influence on congruence in assessment, **the higher the degree of maturity, the more congruent in one's assessment**.

The more effective teamwork, the higher levels of shared cognition, or vice versa!