

# How students write synthesis texts

## Clustering process measures

Marije Lesterhuis, Nina Vandermeulen, Elke Van Steendam, Gert Rijlaarsdam, Sven De Maeyer

# Context and aim

## **Lift research project:**

- Gain insight into how students write synthesis texts
- Gain insight into how process and product measure interrelate
- Develop interventions to improve writing products and processes

## **Focus:**

- Synthesis writing: Writing an informative or argumentative text based on multiple sources
- Pre-university: grade 10 – grade 12

# Context and aim

## Lift research project:

- Gain insight into how students write synthesis texts
- **Gain insight into how process and product measure interrelate**
- Develop interventions to improve writing products and processes

## Focus:

- Synthesis writing: Writing an informative or argumentative text based on multiple sources
- Pre-university: grade 10 – grade 12

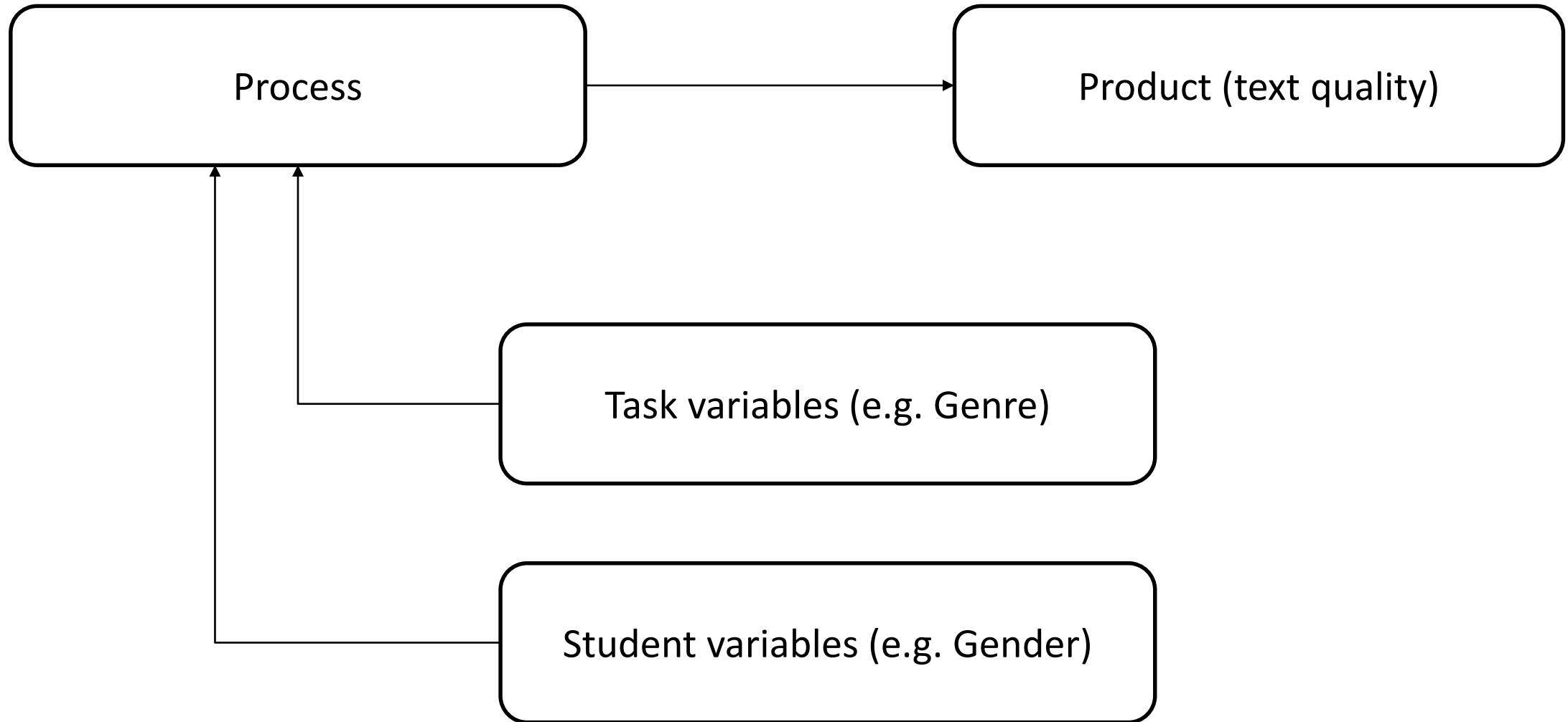
# Writing processes

Process measures:

- Activities: strokes (p.m.), transitions (p.m.), pauses, ....
- Time measures: time spend on writing, reading, pausing, ... (proportional)
- Information per interval

However, more than 300 variables.....

# Why focus on processes?



# Relationship process and product

- Source use related to text quality (Vandermeulen et al. 2019)
- Production related to text quality (Deane, 2014)
- Revision related to text quality (Breetvelt et al., 1994)
- Pausing related to text quality (Almargot et al., 2010)

Most studies approach these variables as independent variables, influencing text quality but ....

# For example

Peter

- Reads sources
- Writes his text from a to z, without pausing
- Revises text: paragraphs are changed from position, sentences rewritten or deleted

Use of time

Sally

- Reads sources and makes notes
- Builds a writing plan, incl. theme and arguments per paragraph
- Writes texts, sometimes pausing to think about the formulation of a sentence
- Revises text minimally: punctuation and a few words

## Aim

- **Gain insight into how process and product measure interrelate**

## Research questions

1. Can we detect types of writers?
2. Are these types related to genre?
3. Are these related to gender?
4. Are these types related to text quality?



# Method

## Data collection

- Students grade 10 -12 (the Netherlands)
- Each student 2 argumentative texts & 2 informative texts
- Text 3 times rated (ICC = .68)
- Inputlog to capture processes
  - Pausing: proportion of time, nr. of pauses p.m., M duration of pauses
  - Writing: proportion of time, strokes p.m.
  - Source: proportion of time, switches between sources p.m., switches source document p.m.
  - Interval 1

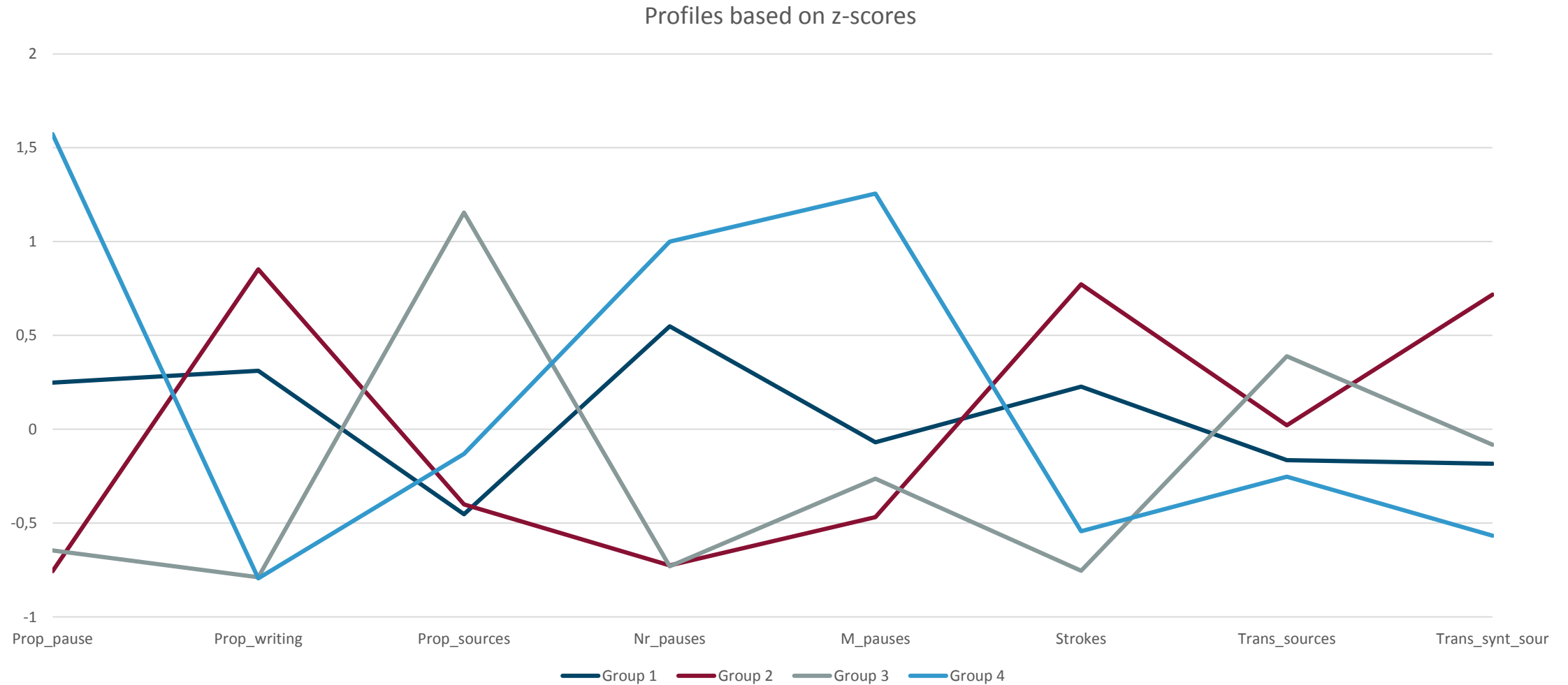
→ **2155 processes (623 students) + text quality measures**

# Method

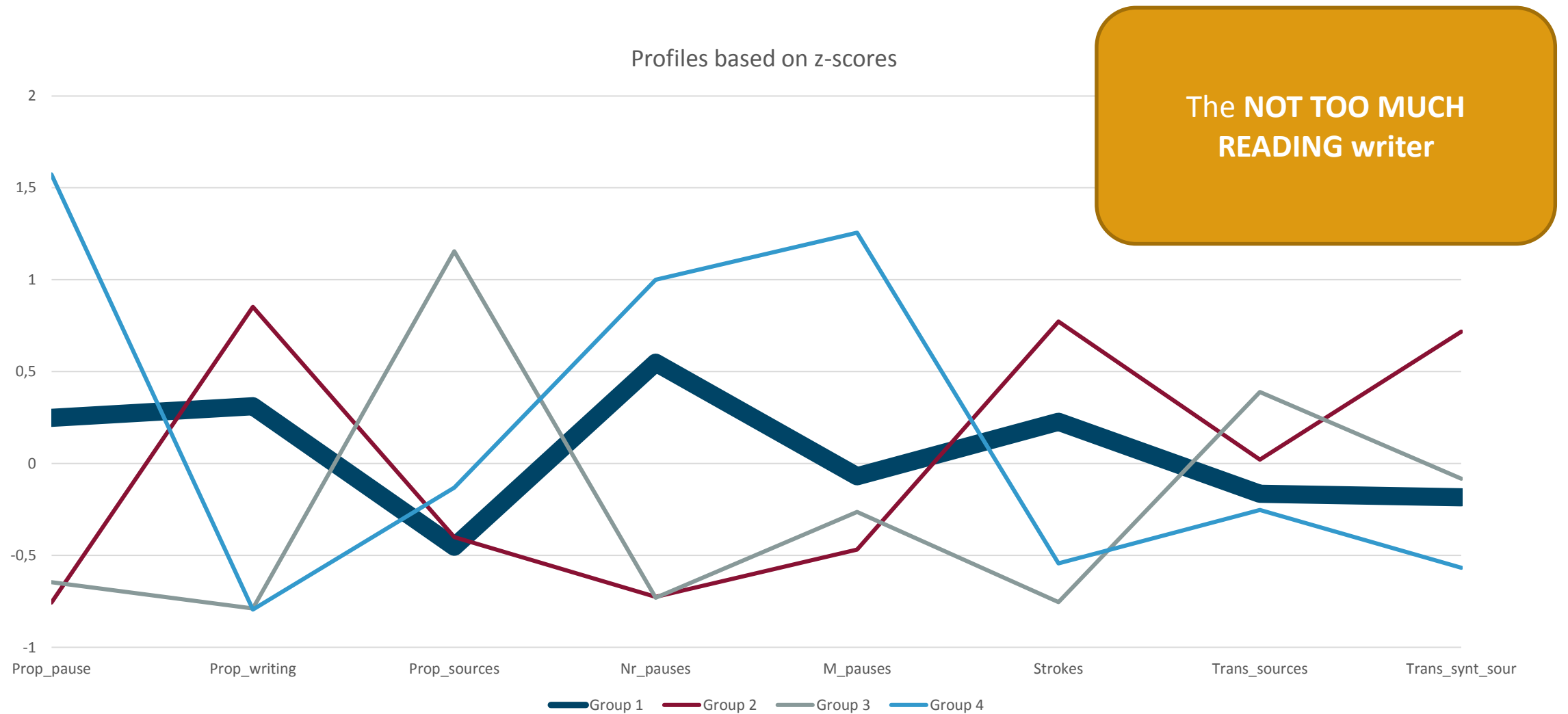
## Analyses

1. Can we detect types of writers?
  - Latent class analyses (LatentGold 5.1)
    - Model based clustering
    - Model selection based on BIC
- 2.&3. Are these types related to genre/gender?
  - Chi-square test
4. Are these types related to text quality?
  - Anova-test

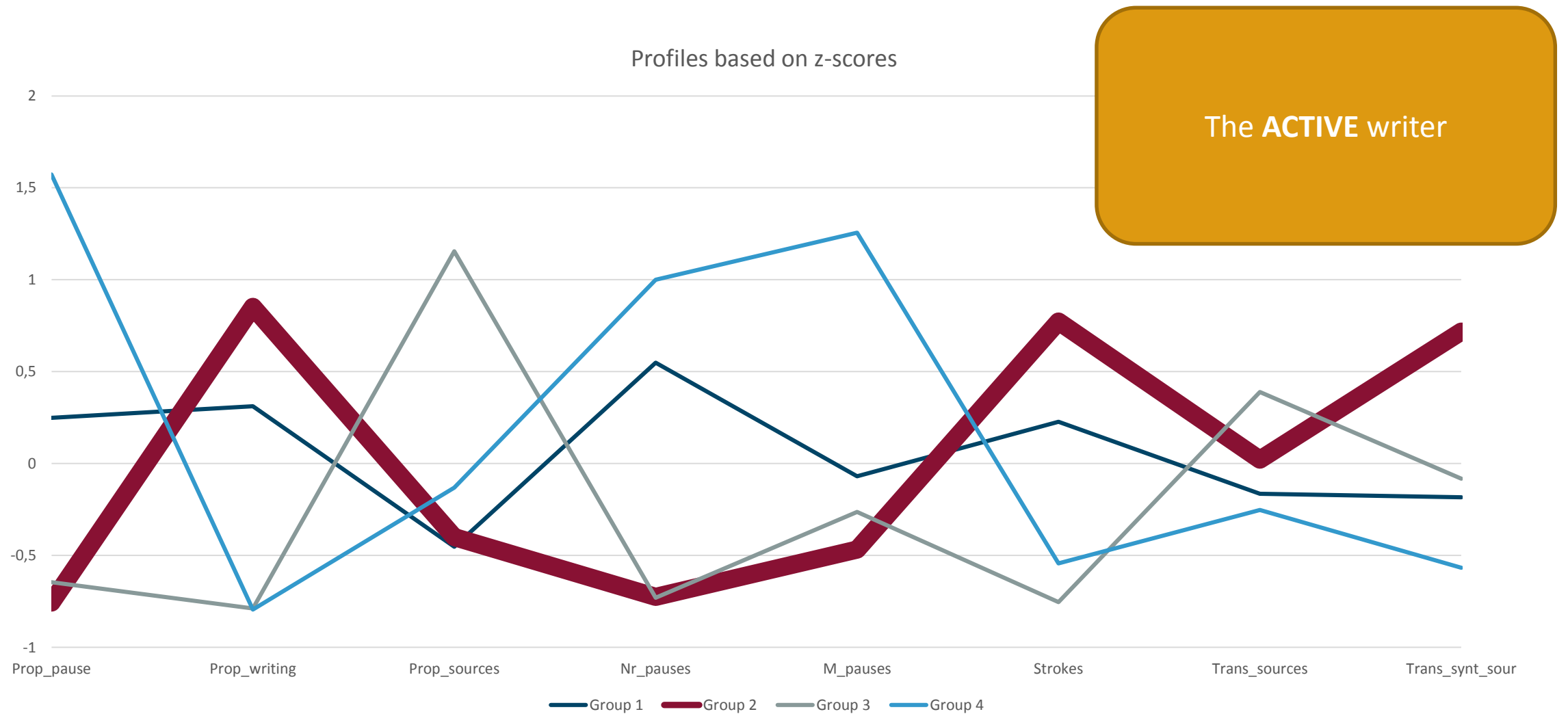
# Results: Types of writers (RQ1)



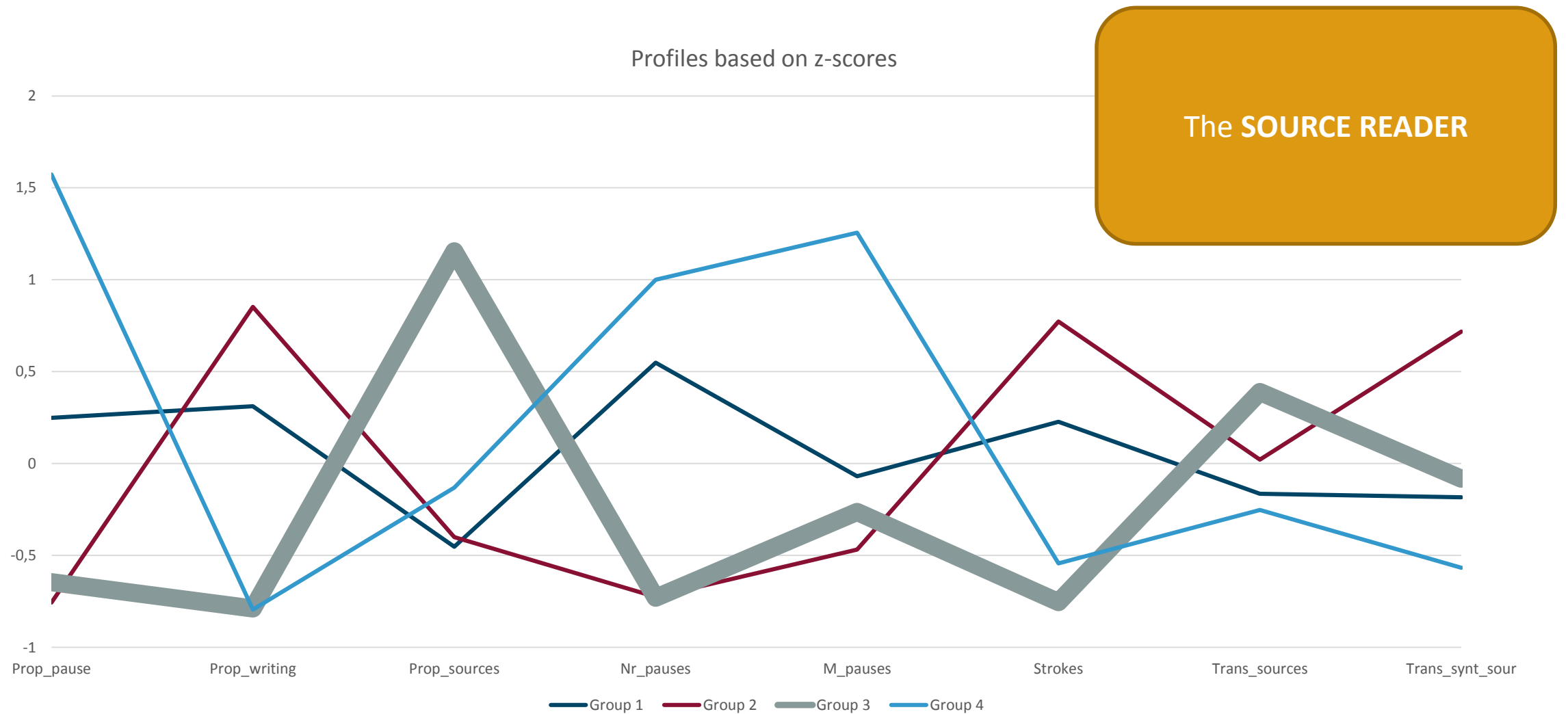
# Results: Types of writers (RQ1)



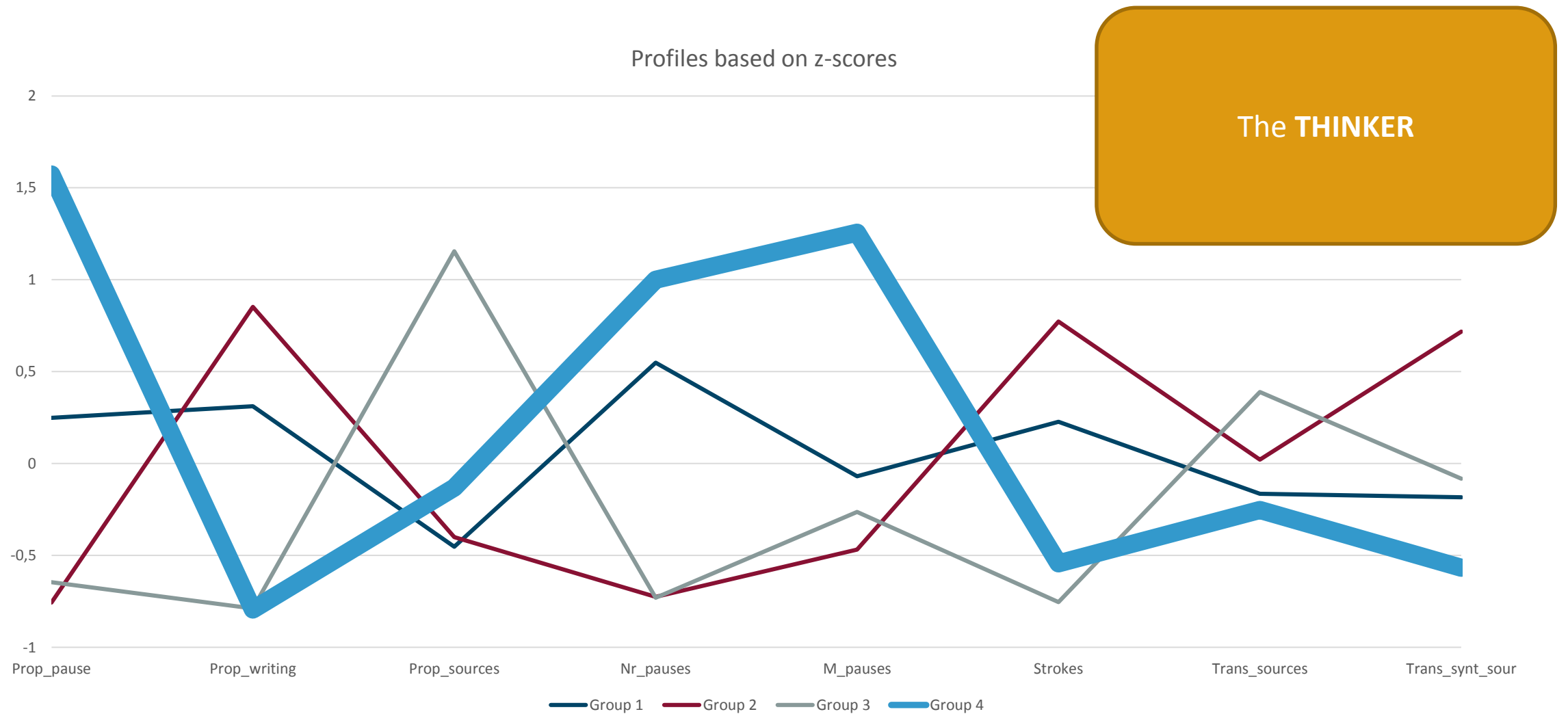
# Results: Types of writers (RQ1)



# Results: Types of writers (RQ1)

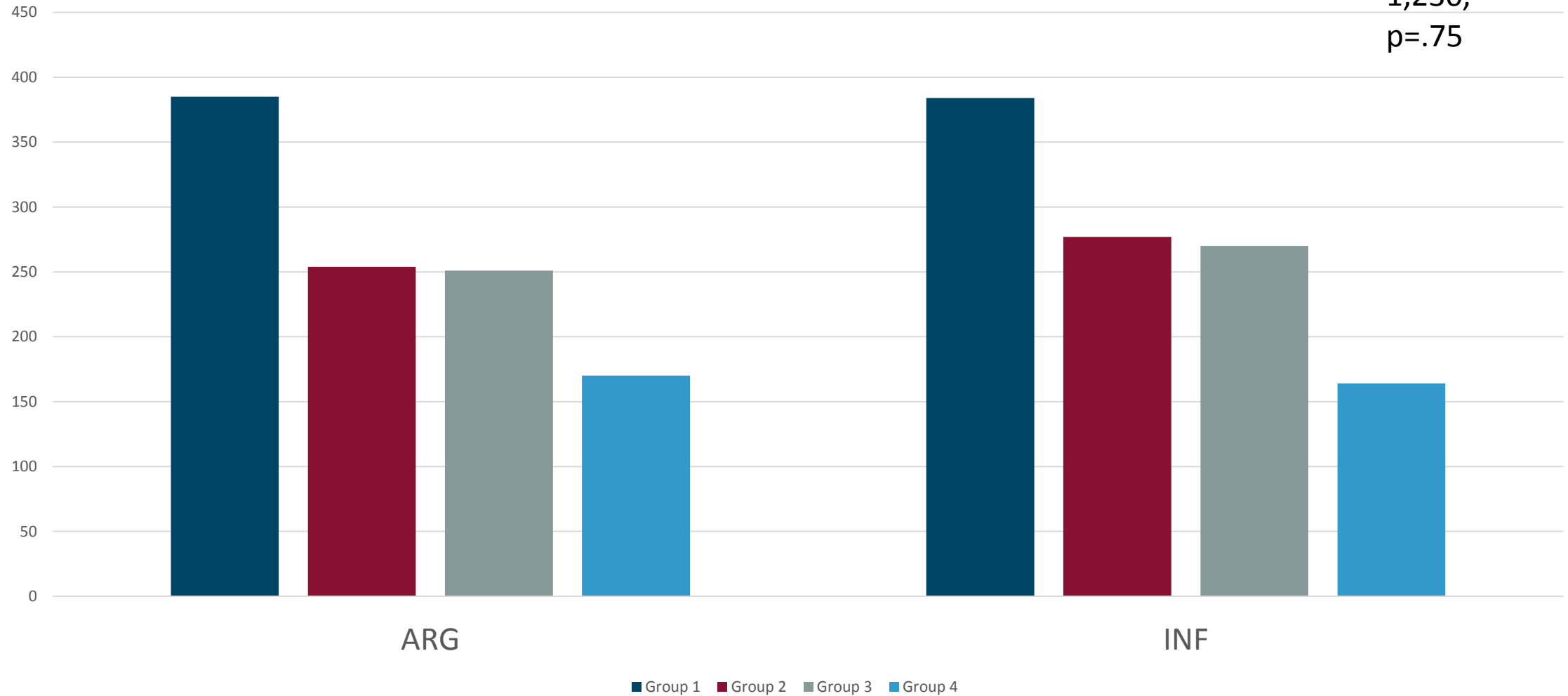


# Results: Types of writers (RQ1)



# Results: Type of proces vs. genre (RQ2)

DF 3,  
value  
1,230,  
p=.75

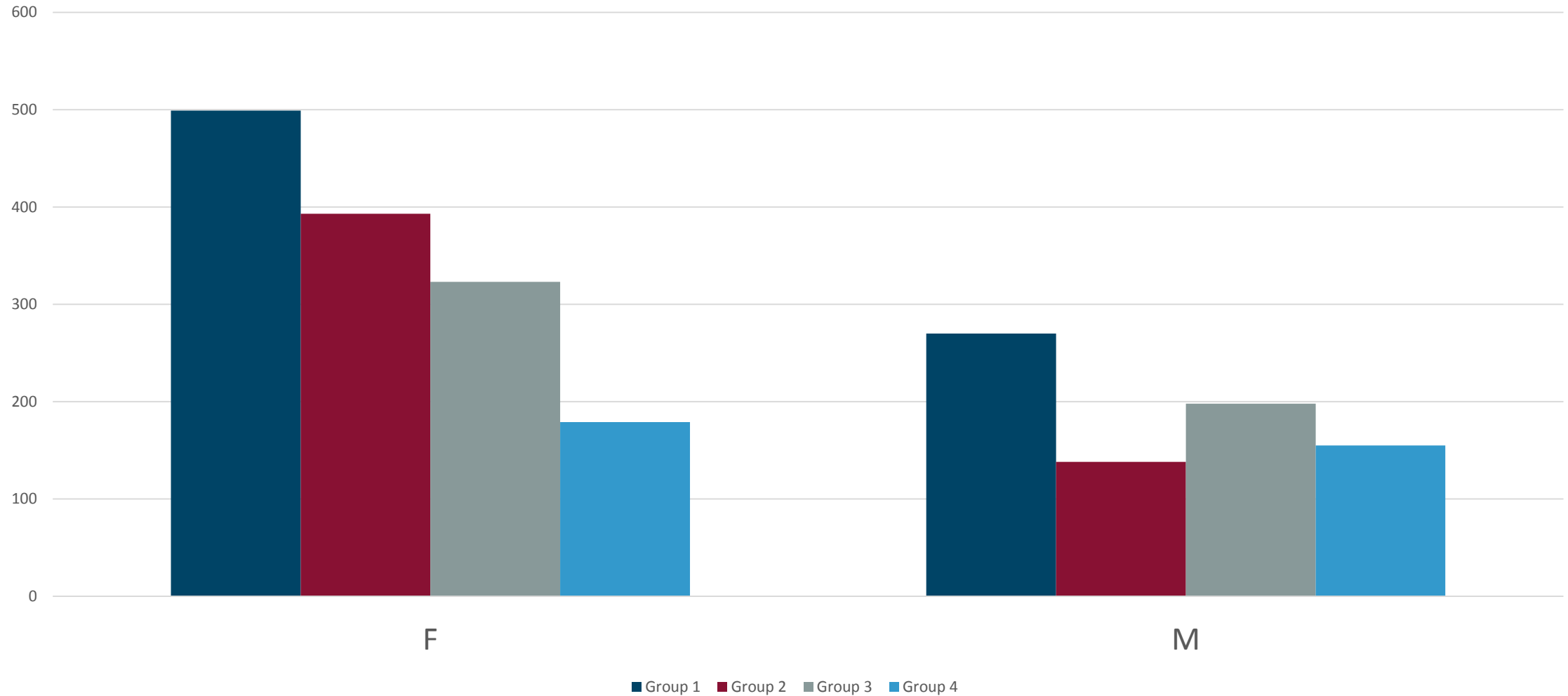


Chi (3) = 1,23 , p=.75





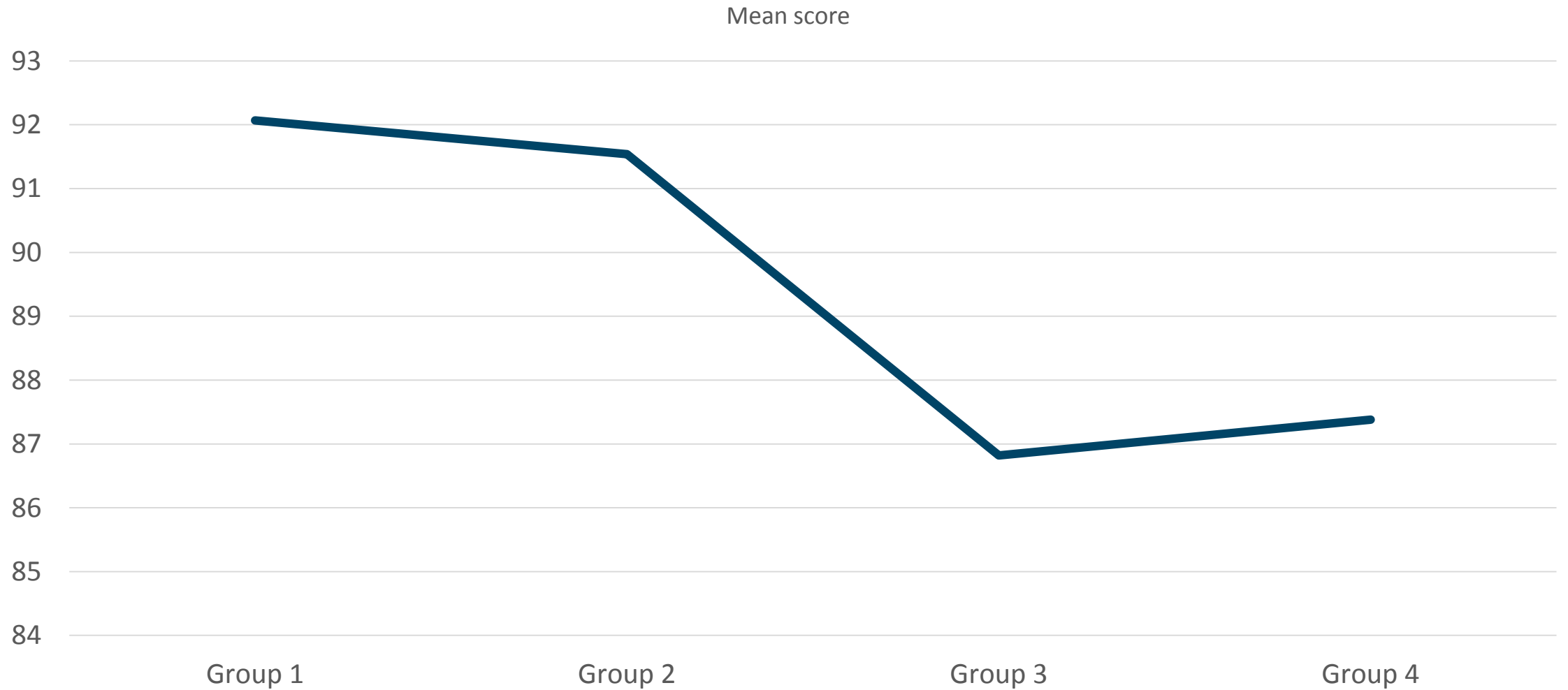
# Results: Types of processes vs. gender (RQ 3)



Chi (3) = 39, 872 ,  $p < .001$



# Relationship with text quality



$F(3,4) = 11,870, p < .001$



# Theoretical implications

Way to acknowledge that there is no one perfect process. But in order to use it:

- Careful selection of the variables
- Careful selection of the intervals
- Taking the multilevel dimension into account
- Triangulation with other methods (e.g. think aloud)

# Practical implications

Using types of writers to

- Create awareness by students that different approaches exist
- Create awareness that processes are interrelated



# Discussion

Should writing education be more focused on the process instead of on the product?

As a teacher, do you want to know how students write? If yes, how would you use this information?

