

## THE INFLUENCE OF EXTRAVERSION AND TEMPERAMENT ON MOTIVATIONAL FACTORS FOR LEARNING

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**Purpose:** The aim of the article is to examine the influence of extraversion and temperament according to the Hippocratic typology on factors motivating and demotivating for learning.

**Design/methodology/approach:** The results of the study were obtained through a literature analysis and a survey (n = 448) conducted among individuals aged 19-26. The study identified the key motivating and demotivating factors for learning, and subjected them to analysis based on temperament types according to the theory and typology of Hippocrates (choleric, melancholic, sanguine, phlegmatic), as well as one of the most commonly occurring personality traits in various motivation theories, namely extraversion.

**Findings:** The research has shown that extraversion does not significantly impact the significance of motivating factors for learning. However, it plays a significantly more important role in the case of demotivating factors for learning. There was also observed a slight influence of temperament type on the impact of individual factors on motivation. The most significant differences were found between the sanguine and melancholic types. Individuals with temperament traits attributed to the sanguine type indicated a stronger significance of many motivating and demotivating factors compared to those who did not identify with this temperament type.

**Research limitations/implications:** The limitations of the article include the fact that selected personality traits and temperaments were self-reported by the respondents. No psychological tests were applied to precisely determine the personal characteristics of the respondents. Another limitation may be the focus solely on one target group of individuals aged 19-26.

**Practical and social implications:** The results indicate that extraverts react more strongly to demotivating factors than introverts. However, extraversion does not seem to be significant in terms of motivating factors. Educators and managers should pay special attention to the demotivating factors mentioned in this article, especially when dealing with extraverted individuals with a sanguine temperament. The findings from these studies can be valuable for educators but also for, for example, training center managers.

**Originality/value:** The research has shown that extraversion is significantly relevant in the context of demotivating factors for learning, while it does not have a significant impact on motivating factors.

**Keywords:** motivation, personality, temperament, students, learning.

**Category of the paper:** research paper.

## 1. Introduction

Motivation is a highly significant aspect of social and economic life. It influences productivity and the quality of life, ranging from motivation to learn new skills, to motivation for work, self-development, investments, purchases, volunteering, and even motivation for maintaining one's own health. Therefore, motivation is the subject of research in various scientific disciplines within the field of social sciences such as psychology, education, management, as well as in the field of medical sciences and health sciences (Government website, 2023). There are numerous motivation theories attempting to explain why people undertake specific actions and what factors influence their behavior. In management literature, often mentioned theories include Maslow's hierarchy of needs (Cox, 1987; Maslow, 1954), Douglas McGregor's Theory X and Theory Y (McGregor, 1960; Pardee, 1990), McClelland's theory (McClelland et al., 1953), Herzberg's two-factor theory (Herzberg, 1968), Vroom's expectancy theory (Pardee, 1990; Vroom, 1964), and Self-Determination Theory (SDT) (Ryan, Deci, 2000, 2017), among others. These theories have formed the basis for many scientific studies. Based on these theories, researchers attempt to develop their own motivation theories incorporating new elements and factors identified during their investigations. These theories take into account the changing conditions of work and the functioning of contemporary individuals in social and economic environments. They are most commonly applied in the context of work motivation and less frequently in other areas and activities of human life. For instance, motivation for maintaining health, pursuing one's passions, engaging in volunteer work, or starting one's own business. Motivation can arise from a multitude of factors, including internal factors related to personality and temperament.

There arises a question about the significance of selected motivating and demotivating factors in terms of personality traits and temperament. The aim of the paper is to analyze popular theories related to personality and temperament. The second objective is to determine how selected personality traits and common temperament types influence the significance of individual motivating and demotivating factors. The subject of the study is motivation for learning.

In the course of researching motivation for learning, the following research question was addressed:

*Does a chosen personality trait (introversion and extraversion) and temperaments according to Hippocrates (choleric, sanguine, melancholic, phlegmatic) influence the significance of selected factors on motivation?*

The publication is organized as follows. Chapter 2 presents and describes issues related to selected theories of human personality and motivation. Chapter 3 describes the conducted research and the obtained results. In the final part of the article, a discussion is conducted, the article is summarized, and directions for further research are proposed.

## 2. Relationships between personality traits, temperament, and motivation

Personality is one of the key aspects of psychology and plays a significant role in understanding human behavior and predicting how an individual will act in various situations. Personality is shaped by various factors, including genetics, upbringing environment, life experiences, cultural influences, and many others. There are numerous personality theories that attempt to explain how human personality is formed and developed, as well as how to study and measure it. Among frequently mentioned personality theories are Carl Gustav Jung's psychodynamic theory, Raymond Cattell's personality trait theory (later developed by Isabel Briggs Myers and Katharine Cook Briggs), and the Five-Factor Model of personality (Big Five). Carl Gustav Jung introduced the concepts of introversion and extraversion. Cattell developed a model of personality traits, describing personality through approximately 16 key traits such as extraversion, neuroticism, and openness to experience. Isabel Briggs Myers and Katharine Cook Briggs further developed these ideas, creating the popular system known as the "Myers-Briggs Type Indicator" (MBTI). Due to criticism from parts of the scientific community, a more modern scientific approach involves using the Big Five model proposed by Paul Costa and Robert McCrae (Costa, McCrae, 1992, 2008). This model describes personality through five major factors: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. Each of these theories involves one of the most popular personality traits - extraversion and introversion. The Five-Factor Model of personality structure by Costa and McCrae has contributed to the development of psychometric methods for personality assessment, including personality inventories such as the NEO-PI-R and its modified version, the NEO-FFI (Zawadzki et al., 1998).

In the literature, personality is often distinguished from temperament. It is assumed that temperament is one component of our personality. Many articles mention the four temperament types originating from the theory proposed by Hippocrates. These are sanguine, choleric, phlegmatic, and melancholic. Hippocrates identified four basic fluids in the body (blood, yellow bile, phlegm, and black bile) (López Beltrán, 2007; Merenda, 1987). The dominance of one of these fluids was believed to determine temperament. Although medical science has corrected knowledge about bodily fluids, the four main temperament types have persisted in common language to this day. Many people often identify with one or two temperament types and can preliminarily determine them independently.

In the modern period, one of the prominent researchers of temperament was Professor Jan Strelau. He is the author of the Regulative Theory of Temperament (RTT) (Strelau, 1996). According to Strelau, temperament regulates behavior in two aspects: energetic and temporal. Characteristics in the domain of energetic features include:

- Sensory sensitivity (the ability to react to subtle sensory stimuli).
- Emotional reactivity (the way of reacting to emotional stimuli).
- Endurance.
- Activity (engaging in activities that provide stimulation).

Temporal characteristics include:

- Quickness (the ability to react quickly and maintain a high pace of activity).
- Perseveration (the tendency to repeat and continue behaviors).
- Rhythmicity (the tendency to maintain a regular lifestyle even when circumstances do not require it).

The theory formulated by Strelau is multidimensional, assuming that temperament manifests itself in all human behaviors and is observable already in infancy. The primary form of temperament results from biological evolution. Temperament traits are relatively stable, with changes occurring slowly throughout an individual's life due to the influence of interactions between biological mechanisms responsible for temperament and environmental factors (Spielman et al., 2020).

In scientific research practice, various psychometric tools are used to study and describe personality. Among frequently utilized tools are: MMPI (Minnesota Multiphasic Personality Inventory), 16PF (Cattell's Personality Questionnaire), NEO-FFI (Personality Inventory in the Big Five model) (Wikipedia, 2023c; IPIP, 2023). MMPI contains 567 questions, while 16PF has around 300 questions to be answered with true, false, or do not know (Wikipedia, 2023a, 2023b). On the other hand, NEO-FFI consists of about 60 self-descriptive statements on a five-point scale (Website, 2023c). Additionally, there are freely available or partially free (e.g., for research or non-commercial purposes) popular personality tests, such as HEXACO-PI-R (Website, 2023a), IPIP-NEO (Website, 2023b), 16Personalities (NERIS Analytics Limited., 2021), etc.

Motivation for learning is one of the areas of scientific research (Huitt, 2001), based on fundamental theories related to motivation. It often links motivation to emotions, satisfaction, and even self-esteem. In the behavioral approach, attention is given to consequences. The use of positive reinforcements encourages improvement in motivation, while the application of punishments acts as a deterrent, resulting in a decline in internal motivation for learning (Huitt, Hummel, 1997). The use of reinforcements and punishments may also impact personality. Hence, the question often arises whether personality and motivation are interconnected and in what way.

To further analyze the literature, Google Scholar and Scopus databases were utilized. A combination of keywords such as motivation, personality, learning, and working was applied. The results are presented in Table 1.

**Table 1.**

*The number of results from the Google Scholar and Scopus databases for various query variations*

<b>Queries to the Scopus database</b>	<b>Number of articles</b>
( TITLE-ABS-KEY ( motivat* ) AND TITLE-ABS-KEY ( personal* ) AND TITLE-ABS-KEY ( work* ) )	17057
( TITLE-ABS-KEY ( motivat* ) AND TITLE-ABS-KEY ( personal* ) AND TITLE-ABS-KEY ( lear* ) )	12230
( TITLE-ABS-KEY ( motivation ) AND TITLE-ABS-KEY ( personality ) AND TITLE-ABS-KEY ( work* ) )	2825
( TITLE-ABS-KEY ( motivation ) AND TITLE-ABS-KEY ( personality ) AND TITLE-ABS-KEY ( learning ) )	1908
( TITLE ( motivat* ) AND TITLE ( personal* ) AND TITLE ( lear* ) )	104
( TITLE ( motivat* ) AND TITLE ( personal* ) AND TITLE ( work* ) )	71
( TITLE ( motivation ) AND TITLE ( personality ) AND TITLE ( learning ) )	37
( TITLE ( motivat* ) AND TITLE ( personal* ) AND TITLE ( lear* ) AND TITLE ( stud* ) )	28
<b>Query to the Google Scholar (option: review articles)</b>	
personality learning	125000
motivation personality	21300
motivation personality working	23500
allintitle: personality learning	70
allintitle: motivation personality	29

Note. TITLE-ABS-KEY - means searching for a specific character string in titles, keywords, or abstracts.  
\*- replaces any sequence of characters. allintitle: - searches for keywords only in titles.

### 3. Materials and Methods

#### 3.1. Research sample and questionnaire

The research was conducted from 2022 to 2023 on a group of students majoring in management, logistics, production engineering, and business analytics, aged 19 to 26. Based on the analysis of scientific literature, personal observations, and preliminary research conducted in the form of open-ended questions, motivating and demotivating factors for learning were identified. An electronic questionnaire was constructed, and in addition to questions related to the identified factors, respondents were asked to indicate their gender, personality traits, and temperament. Respondents did not have major difficulties in determining one of the personality traits, such as extraversion, on a five-point scale. They had slightly more difficulty determining their own temperament. Therefore, to facilitate this, very brief characteristics of the 4 temperament types were also provided:

- Choleric (energetic, impulsive, and sometimes unrestrained individuals; their feelings arise rapidly and can be intense).
- Phlegmatic (unimpassioned and emotionally reserved individuals, yet consistent in their feelings and persevering in action).
- Sanguine (sensitive individuals who react quickly and strongly, while also being resilient and adaptable to circumstances).
- Melancholic (unimpassioned, gentle, and passive individuals, also less persevering; their feelings may be strong but develop slowly).

Respondents could select no more than two temperament types with which they most identified. After excluding qualitatively doubtful responses, 448 answers were considered for statistical analysis. Table 2 presents the profile of respondents.

**Table 2.**  
*Profile of respondents*

Demographic items		Frequency	Percentage (%)
<b>Gender</b>			
Female		245	54.7
Male		203	45.3
<b>Age</b>			
19-26		448	100
<b>(P1) Personality 1 (own opinion)</b>			
Introvert, rather introverted		150	33.5
Ambivert (balanced)		178	39.7
Extrovert, rather extrovert		120	26.8
<b>(T1) Temperament (own opinion)</b>			
Choleric (Ch)			
	NO (0)	313	69.9
	YES (1)	135	30.1
Phlegmatic (F)			
	NO (0)	360	80.4
	YES (1)	88	19.6
Sanguinarian (S)			
	NO (0)	208	46.4
	YES (1)	240	53.6
Melancholic (M)			
	NO (0)	380	84.8
	YES (1)	68	15.2

Source: own work.

The list of factors motivating and demotivating learning is presented in Table 3 and Table 4.

**Table 3.***Motivating factors for learning*

ID	Motivating factors
MF1	Small but immediate reward (e.g., pluses)
MF2	Topics related to interests
MF3	Desire to be one of the best in the group
MF4	Avoidance of being one of the worst in the group
MF5	Interesting practical knowledge
MF6	Interesting theoretical knowledge
MF7	Small immediate penalty for lack of preparation (for learning)
MF8	Obtaining a certificate of acquired skills
MF9	Intriguing tasks
MF10	Group work
MF11	Positive atmosphere in classes
MF12	Possibility of obtaining a scholarship
MF13	Listening to music in the background

Source: own work.

**Table 4.***Demotivating factors for learning*

ID	Demotivating factors
DF1	Stress in classes
DF2	Noise
DF3	Too much material to study
DF4	Public questioning "at the board"
DF5	Peer reluctance to learn
DF6	Material that is too difficult
DF7	Unfair grading by the teacher
DF8	Impractical knowledge
DF9	Long, monotonous classes
DF10	A lot of theory, little practice
DF11	Unpleasant teacher
DF12	Cheating by other peers (e.g., copying tasks)
DF13	Outdated and boring material
DF14	Criticism from the teacher
DF15	Nice weather
DF16	Unpleasant atmosphere in the group
DF17	Competition for grades in the group
DF18	Various distractions (Facebook, messages, YouTube) (During COVID-19)
DF19	Lack of physical contact with peers (During COVID-19)
DF20	Lack of physical contact with the teacher (During COVID-19)

Source: own work.

Cronbach's alpha coefficient for questions regarding motivating factors (MF1 - MF13, 13 items) was 0.757, and for questions related to demotivating factors (DF1 - DF20, 20 items), it was 0.847. The obtained results confirmed the high and acceptable reliability of the research tool and its results.

### 3.2. Statistical Analysis

For the statistical analysis, data from 448 questionnaires were utilized ( $n = 448$ ). During the analysis, a comparison of responses was conducted using non-parametric statistical tests for the selected personality trait of the 4 temperament types. Descriptive statistical analysis regarding quantitative advantages primarily involved obtaining measures such as the arithmetic mean (Mean), standard deviation (SD), and median (Mdn). A Likert scale was applied. The Mann-Whitney U test was used to compare two groups with distributions other than normal. The significance of differences between layer weights was checked using the chi-square test. Statistical hypotheses were verified using statistical tests, considering significance at  $\alpha \leq 0.05$ . In multivariate analysis, correspondence analysis was used to examine the correlation between temperament, gender, and the personality trait of extraversion. The results were analyzed in the form of a two-dimensional plot depicting relationships between individual groups.

### 3.3. Results

In the analyzed population, there were 448 respondents aged 19-26. Thanks to the obtained results, motivators and demotivators for learning could be ranked from the most significant.

Respondents indicated that the most motivating factors for learning include: topics related to interests (MF2,  $4.11 \pm 1.05$ ), interesting practical knowledge (MF5,  $3.95 \pm 1.06$ ), obtaining a certificate of acquired skills (MF8,  $3.93 \pm 1.13$ ), as well as a positive atmosphere in classes (MF11,  $3.84 \pm 1.12$ ).

The most demotivating factors for learning are: long, monotonous classes (DF9,  $4.29 \pm 0.96$ ), impractical knowledge (DF8,  $4.14 \pm 1.02$ ), unfair grading by the teacher (DF7,  $4.07 \pm 1.11$ ), too much material to learn (DF3,  $4.05 \pm 1.06$ ), outdated and boring material (DF13,  $4.02 \pm 1.05$ ), a lot of theory and little practice (DF10,  $3.98 \pm 1.05$ ), but also an unsympathetic teacher (DF11,  $3.97 \pm 1.12$ ). The results are presented in Table 5 for gender and extraversion (extravert, ambivert, introvert).

**Table 5.**

*The ranking of the shared significance of factors for motivation to learn (all responses and based on the extraversion trait)*

ID	All (All=448)			Extravert (E=120)	Ambivert (A=178)	Introvert (I=150)
	Mean	Median	SD	Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD
1	2	3	4	6	7	8
DF9	4.29	5.00	0.96	$4.29 \pm 0.87$	$4.36 \pm 0.94$	$4.2 \pm 1.04$
DF8	4.14	4.00	1.02	$4.15 \pm 0.93$	$4.15 \pm 1.07$	$4.13 \pm 1.04$
MF2	4.11	4.00	1.05	$4.23 \pm 0.96$	$4.11 \pm 1.05$	$4.01 \pm 1.12$
DF7	4.07	4.00	1.11	$3.98 \pm 1.16$	$4.14 \pm 1.07$	$4.05 \pm 1.1$
DF3	4.05	4.00	1.06	$3.98 \pm 1.12$	$4.06 \pm 1.1$	$4.09 \pm 0.98$
DF13	4.02	4.00	1.05	$3.95 \pm 1.08$	$4.08 \pm 1.05$	$4 \pm 1.04$
DF10	3.98	4.00	1.05	$3.98 \pm 1.1$	$4.02 \pm 1.02$	$3.93 \pm 1.05$
DF11	3.97	4.00	1.12	$4 \pm 1.15$	$4.01 \pm 1.12$	$3.91 \pm 1.11$



Cont. table 5.

MF5	3.95	4.00	1.06	4.02 ±1	3.98 ±1.06	3.85 ±1.1
MF8	3.93	4.00	1.13	4 ±1.08	3.96 ±1.14	3.84 ±1.16
MF11	3.84	4.00	1.12	3.88 ±1.15	3.86 ±1.09	3.78 ±1.12
DF4	3.70	4.00	1.30	3.35 ±1.35	3.71 ±1.32	3.96 ±1.18
DF1	3.68	4.00	1.30	3.28 ±1.37	3.76 ±1.23	3.91 ±1.25
DF2	3.62	4.00	1.24	3.39 ±1.32	3.65 ±1.19	3.77 ±1.2
DF6	3.62	4.00	1.15	3.5 ±1.18	3.65 ±1.16	3.67 ±1.11
DF16	3.58	4.00	1.22	3.53 ±1.27	3.54 ±1.24	3.68 ±1.14
MF9	3.56	4.00	1.16	3.53 ±1.15	3.52 ±1.22	3.63 ±1.1
DF14	3.55	4.00	1.24	3.25 ±1.2	3.62 ±1.31	3.7 ±1.16
DF18	3.35	3.00	1.34	3.38 ±1.34	3.31 ±1.32	3.37 ±1.38
MF6	3.33	3.00	1.12	3.33 ±1.14	3.37 ±1.12	3.31 ±1.1
DF15	3.21	3.00	1.38	3.36 ±1.42	3.22 ±1.33	3.09 ±1.4
DF19	3.17	3.00	1.40	3.45 ±1.38	3.15 ±1.43	2.99 ±1.36
MF10	3.07	3.00	1.22	3.23 ±1.22	3.13 ±1.19	2.85 ±1.24
MF4	3.06	3.00	1.40	3.03 ±1.49	3 ±1.43	3.16 ±1.3
MF12	3.02	3.00	1.50	3.08 ±1.5	2.94 ±1.49	3.07 ±1.51
DF12	2.90	3.00	1.38	2.73 ±1.39	2.85 ±1.41	3.09 ±1.32
MF13	2.83	3.00	1.45	2.91 ±1.48	2.81 ±1.46	2.81 ±1.41
DF17	2.78	3.00	1.37	2.53 ±1.28	2.9 ±1.43	2.83 ±1.33
MF1	2.75	3.00	1.27	2.77 ±1.22	2.75 ±1.31	2.73 ±1.26
DF20	2.73	3.00	1.36	3 ±1.38	2.63 ±1.34	2.63 ±1.36
MF3	2.68	3.00	1.31	2.79 ±1.35	2.64 ±1.35	2.63 ±1.25
DF5	2.52	2.00	1.20	2.31 ±1.14	2.46 ±1.17	2.75 ±1.24
MF7	2.35	2.00	1.31	2.28 ±1.29	2.28 ±1.35	2.49 ±1.28

Source: Own work.

Considering one of the personality traits, which is extraversion, statistically significant differences were found between two groups (Extraversion, Introversion). Interestingly, these differences were observed only in demotivating factors. Motivating factor M10 (group work) was ultimately considered neutral, even though it initially appeared as a motivating factor in preliminary studies. They are presented in table 6.

**Table 6.**

*Differences in the impact of individual motivating and demotivating factors on motivation. Mann–Whitney U test results for variable Personality: Introwertyk (I = 150), Ekstrawertyk (E = 120)*

Variable	Test Probability (p)	Significance	Introvert	Extravert
MF10	0.0179	*	2.85 ±1.24	3.23 ±1.22
DF1	0.0001	***	3.91 ±1.25	3.28 ±1.37
DF2	0.0181	*	3.77 ±1.2	3.39 ±1.32
DF4	0.0001	***	3.96 ±1.18	3.35 ±1.35
DF5	0.0029	**	2.75 ±1.24	2.31 ±1.14
DF12	0.0313	*	3.09 ±1.32	2.73 ±1.39
DF14	0.0014	**	3.7 ±1.16	3.25 ±1.2
DF19	0.0043	**	2.99 ±1.36	3.45 ±1.38
DF20	0.0290	*	2.63 ±1.36	3 ±1.38

Note: \* p &lt; 0.05 \*\* p &lt; 0.01, \*\*\*p &lt; 0.005.

Source: Own work.

The impact of the temperament type specified by the respondents on motivating and demotivating factors was also examined. Respondents could select 1 to 2 temperament types that most characterized them. In most cases, there were no significant differences in the impact of individual temperaments on motivators and demotivators. The most significant differences were observed in sanguine individuals, for whom individual motivators are more relevant (indicated by \* (+)). On the other hand, respondents with a melancholic temperament showed a lesser impact of individual motivators and demotivators on motivation (indicated by \* (-)) than the rest of the research sample. This particularly applied to motivators such as the desire to be one of the best in the group (MF3), interesting practical knowledge (MF5), the possibility of obtaining a scholarship (MF12), as well as demotivators such as impractical knowledge (DF8) and (during covid-19) lack of physical contact with peers (DF19). The significant results are also presented in Table 7.

**Table 9.**

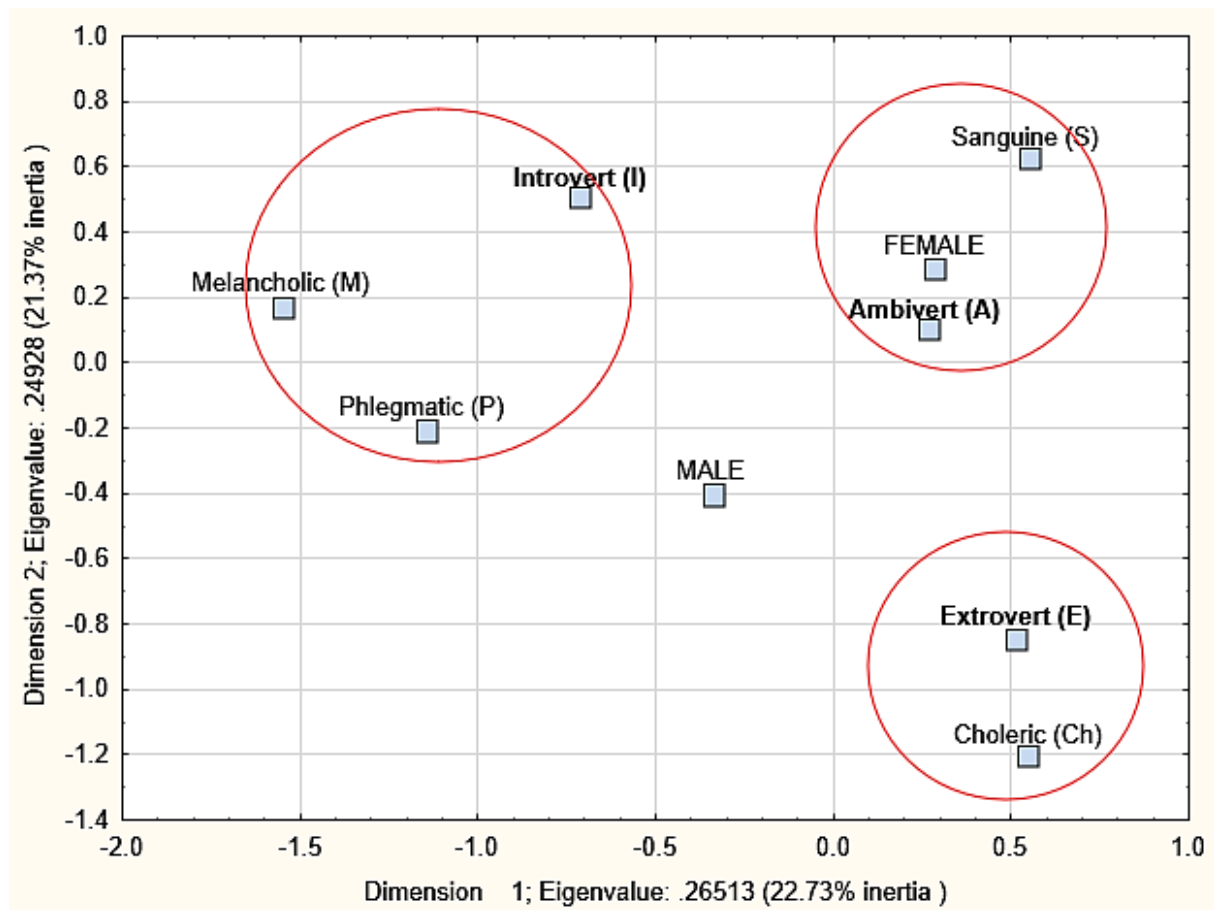
*Differences in the impact of individual motivating and demotivating factors on motivation. Mann–Whitney U test results for variable Temperament: Choleric (Ch = 135), Melancholic (M = 68), Phlegmatic (F = 88), Sanguine (S = 240)*

ID	Choleric YES (Ch = 135)		Melancholic YES (M = 68)		Phlegmatic YES (F = 88)		Sanguine YES (S = 240)	
	p	Significance	p	Significance	p	Significance	p	Significance
MF3			0.0131	* (-)				
MF5			0.0310	* (-)	0.0199	* (+)	0.0358	* (+)
MF7					0.0180	* (-)		
MF9							0.0290	* (+)
MF12			0.0060	** (-)			0.0178	* (+)
MF13							0.0332	* (+)
DF1					0.0253	* (-)	0.0225	* (+)
DF4	0.0284	* (-)						
DF7							0.0250	* (+)
DF8			0.0120	* (-)			0.0376	* (+)
DF17					0.0360	* (-)	0.0052	* (+)
DF19			0.0347	* (-)				

Note: \* p < 0.05 \*\* p < 0.01, \*\*\*p < 0.005.

Source: Own work.

The correspondence analysis was conducted between temperament, gender, and the personality trait of extraversion (Figure 1). It can be observed that the melancholic and phlegmatic temperaments are closely associated with individuals having introverted traits. On the other hand, the choleric temperament is in proximity to the extraverted personality trait. Meanwhile, the sanguine temperament is situated near ambiverts, between introverted and extraverted traits. This partially confirms the connection proposed by Hippocrates between the names of temperaments and the personality traits of extraversion and introversion.



**Figure 1.** The correspondence analysis: Gender, Temperament and Personality (introvert, ambivert, extrovert).

#### 4. Discussion and summary

In the study, the decision was made to use a self-assessment mechanism in which respondents determined their own temperament and introversion. However, in many studies (Gwiazdowska, Klinkosz, 2012), instruments such as the NEO-FFI personality inventory and the LMI achievement motivation inventory (Klinkosz, Sękowski, 2006, 2013) are often used, which are considerably more time-consuming for respondents.

In a study from 2018 (Klinkosz et al., 2018), an analysis was conducted on 233 Polish university students and 188 German university students regarding motivation and personality. The research presented numerous relationships between achievement motivation and personality traits among students. Conscientiousness was recognized as the strongest predictor of success motivation for students from various fields of study and in different countries. In this study, conscientiousness was not analyzed; only extraversion was examined, which turned out to be significant and influencing only demotivating factors. Slight differences in various temperaments proposed by Hippocrates were also observed. Especially individuals

exhibiting traits of the sanguine temperament are more sensitive to various motivating and demotivating factors among the surveyed representatives of Generation Z.

In Kyllonen's work (Kyllonen et al., 2014), a review of numerous studies was conducted, showing that personality factors and motivations are associated with educational outcomes from early childhood to adulthood. The data also considered that personality and motivation change over time, despite the common belief that we have a personality we were born with. Average changes in personality occur over a lifetime. As we grow and enter adulthood, we become more conscientious, caring towards others, socially dominant, and emotionally stable. This change suggests that personality can be considered a skill that can be developed like other skills (Kyllonen et al., 2014; Roberts et al., 2006; Roberts, DelVecchio, 2000). Therefore, studying learning motivation should be conducted in different age groups and generations.

Personality and motivation also play a role in income (Gwiazdowska, Klinkosz, 2012) or benefits. For students, income or benefits can include acquired knowledge, skills, certificates, diplomas, etc. In many publications, e.g., (Conard, 2006; Nofle, Robins, 2007; O'Connor, Paunonen, 2007), it has been shown that conscientiousness, as one of the Big Five traits, and especially its aspects such as achievement striving, self-discipline, and diligence, allow predicting academic success from early grades to college. Other Big Five factors were less consistent in predicting school performance; however, there is some evidence that neuroticism, especially its anxious and impulsive aspects, can hinder learning, while openness may enhance it (Kyllonen et al., 2014). Interestingly, conscientiousness is associated with morningness (Randler, 2008).

In the studies of Ahmadi-Azad et al. and Anggraini et al. (Ahmadi-Azad et al., 2020) (Anggraini et al., 2021), it has been demonstrated that a teacher's personality in the learning process is one of the important factors for achieving success in language learning. A positive atmosphere resulting from the teacher's personality can encourage students to participate in foreign language learning (Ahmadi-Azad et al., 2020). It has also been shown that higher self-efficacy leads to more frequent use of various learning strategies, increased effort, sustained persistence, and higher achievements in various tasks (Bandura et al., 1999; Lee, Klein, 2002; Schunk, 1990). Providing students with extensive feedback and helping them gain an initial level of competence in a specific field will lead to an increased sense of self-efficacy (Kyllonen et al., 2014).

In this article, popular theories related to personality traits and temperament were analyzed, and the results of our own research conducted among 448 Generation Z respondents were presented. Although this work addresses issues strongly related to psychology, the research findings can be valuable and useful not only for educators but also for managers and project leaders. It is crucial to pay attention to the differences in the perception of various motivating and demotivating factors among individuals with different personality traits and temperaments. Temperament and extraversion can influence the significance of specific motivational and,

especially, demotivational factors. Regarding motivating factors, no statistically significant differences were found between the examined groups. However, much less variation is observed in the case of different temperament types, which may be due to respondents' difficulties in independently determining their dominant temperament type on a scale from zero to one. In the future, it is recommended to expand research on motivation, temperament, and personality traits, considering other characteristics such as openness to experience, conscientiousness, agreeableness, and neuroticism, and utilizing available psychological testing tools.

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