The Impact of Perceived Dissimilarity on Perceived Academic Performance and

the Mediating Role of Sense of Belonging

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Abstract

The present study looks at the effects of perceived dissimilarity on sense of belonging and academic performance while taking personality into account. Previous research in the workplace has shown that perceived deep-level dissimilarity can have a negative impact on sense of belonging and in turn on work-related outcomes. We aimed to replicate these findings in the student population. Specifically, we expected that perceived dissimilarity would have a negative impact on perceived academic performance and that this relationship would be mediated by sense of belonging. We developed a questionnaire for which we got 128 responses from psychology students. Our results show that perceived deep-level dissimilarity has an impact on perceived academic performance and that this relationship is mediated by sense of belonging. We conclude that it is essential for students to feel belonging to perceive their academic performance positively. Universities should implement interventions to ensure their students feel belonging to their peers as well as the faculty and program.

Keywords: perceived dissimilarity, sense of belonging, perceived academic performance, personality

The Impact of Perceived Dissimilarity on Academic Performance and the

mediating role of Sense of Belonging

Universities as well as many workplaces are very diverse and multicultural nowadays (Guerin & Green, 2016). Individuals come together from different countries, religions and cultures. The similarities or dissimilarities that arise between individuals are easily identifiable ones like gender or ethnicity but also underlying differences in values and beliefs (Sahin et al., 2019). The way that people differ can make life complicated but at the same time also very interesting. Dissimilarities in beliefs or values can often lead to heated discussions and are the basis for many political, religious and cultural debates. It is no surprise that these differences have an impact on many aspects of our personal lives as well. Whether it concerns an argument with our family members or friends or trying to integrate into a new school or job, dissimilarities come in different shapes and forms, but they are present almost everywhere we go. Universities such as the University of Groningen have students from over 120 nationalities which entails lots of differences on the surface as well as on a deeper level. Most students face the challenge of finding their way into the university environment and integrate into the culture of the country they now live in, including the building of meaningful relationships with fellow students. If students have trouble integrating into the new environment because of perceived dissimilarities to fellow students or the university, negative consequences can follow for example loneliness or feelings that they are not part of their program. We argue that this can have a negative impact on their academic performance in turn.

It is crucial to understand how perceived dissimilarities impacts student's academic performance to be able to construct supporting or buffering interventions to ensure the best possible performance by students.

The effects of perceived dissimilarities have often been studied in the workplace (Liao et al., 2008; Sahin et al. 2018; Cunningham, 2007) but there is also quite some literature referring to research in universities (Stevens, Liu & Chen, 2018; Lane & Gibbons, 2007; Harm, Roberts & Winter, 2006). The overall picture shows that high dissimilarities can lead to negative outcomes such as low sense of belonging or negatively comparing yourself to others that in turn also impact academic performance (Lane & Gibbons, 2007; Sahin et al. 2018).

Perceived dissimilarity relates to prejudiced induced issues like microaggressions and discriminative behavior concerning majority and minority groups based on ethnic or cultural differences (Brannon and Lin, 2020; Stevens et al., 2018). Dissimilarities can also be perceived in personality. This means that people perceive themselves as dissimilar in personality traits compared to their fellow students which can contribute to poorer academic performance (Zanon et al., 2019; Lee at al., 2014). Lastly, perceived dissimilarities regarding person-group or person-environment also have negative effects on academic performance and work-related outcomes (Suhlmann et al., 2018; Wurster et al., 2021).

In this study we aim to understand how deep- and surface-level dissimilarities influence perceived academic performance through sense of belonging. This study adds to previous literature by examining effects of perceived dissimilarity and sense of belonging on perceived academic performance in the student population, which has not been studied extensively yet. Additionally, this study examines to what extent neuroticism may impact this relationship.

Perceived Dissimilarity and Academic Performance

Although there is not much research about a direct relationship between perceived dissimilarity and academic performance, previous research describes the effects of dissimilarities on different work-related outcomes. Perceived dissimilarity is often divided

into deep-level and surface-level dissimilarity. This distinction is found numerous times in the

literature and most researchers agree on what facets belong to which level. For example,

surface-level dissimilarities include easily observable features like ethnicity, gender, and age

(Sahin, 2019; Kacmar et al., 2009) while deep-level dissimilarities include more underlying

characteristics like attitudes, values and beliefs but also personality (Sahin, 2019; van

Emmerik & Brennikmeijer, 2009). This is an important distinction to make because the

outcomes of either surface- or deep-level dissimilarities can be quite different depending on

the context. It appears that deep-level dissimilarities have a stronger effect in most studies

than surface-level (Sahin et al., 2019; Liao et al., 2008).

     Dissimilarities can be perceived between individuals generally but also among an

individual and a group. A person-group fit as well as person-environment fit both contribute

to the relationship between perceived dissimilarities and academic performance. This implies

that similarities or dissimilarities in values shared between individual students and groups or

individual students and the university impact academic performance (Wurster et al., 2021).

     Academic performance is defined as the extent that individuals reach their

educational goal and how well they are doing. It is often measured by grades (e.g., GPA) but

also drop-out intention and academic motivation. Alternatively, academic performance can

also be measured as perceived academic performance rated by students themselves or peers,

parents or teachers. For example, Chang, Tu and Hajiyev (2019) use self-perceived academic

skills, learning abilities, and confidence in academic success as a measure of perceived

academic achievement.

     Previous research showed that a high degree of dissimilarity had a negative effect on

grades (Suhlmann et al. ,2018). Lane and Gibbons (2007) described how students who view

themselves dissimilar to the prototypical student that is viewed good and favorably had worse

academic outcomes than their peers. Whereas the distinction is not explicitly made in this

article, deep-level dissimilarities were measured by characteristics such as independency and anger while surface-level dissimilarities were measured by characteristics such as age and gender.

The study by Sahin (2019) also found that mostly deep-level dissimilarity had a negative effect on work-related outcomes while for surface-level dissimilarity none or only small effects were found. Moreover, previous research (Liao, Chuang & Joshi, 2008) also found that when controlling for actual and perceived surface-level dissimilarity, there was a significant negative correlation between deep-level dissimilarities and job attitude and helping behavior. Additionally, the researchers found that higher perceived deep-level dissimilarity can lead to work withdrawal behavior and voluntary turnover. Although the effects of deep-level dissimilarities are more pronounced in the literature, previous research (Cunningham, 2007) shows that surface-level dissimilarities can still influence deep-level differences. It was shown that perceiving others as demographically different can influence perceived deep-level dissimilarities which in turn impacts work-related outcomes. This outcome highlights that although deep-level dissimilarity influences work- and academic related outcomes, surface-level dissimilarity still has some impact in this relationship.

Moreover, previous research shows that student's change in hope and belonginess were shown to influence academic performance only in the context of similar changes in group hope and belongingness which means low dissimilarity to the group (Wurster et al., 2021). A person-environment fit, described by high similarities between student's self-construal and university norms, has a direct positive impact on academic performance (Suhlmann et al., 2018) but also generally with student's statements about the student compared to the student's perception of the university's environment (Harms et al., 2006).

In conclusion, dissimilarities can arise from quite different sources but in the end, they do seem to have an influence on academic performance. We expect that deep-level

dissimilarities have a bigger impact on academic performance than surface-level

dissimilarities which leads to our first hypothesis: Higher deep-level but not surface-level

dissimilarities negatively impact academic performance (H1).

Perceived Dissimilarity in Personality

For my individual focus of perceived dissimilarity, I concentrate on personality.

Specifically, neuroticism and extraversion. As one of the big five personality traits (Costa &

McCrae, 1992), neuroticism represents the "darker side" of personality related to experiencing

many negative emotions or states such as anxiety, anger and depression. Additionally,

neuroticism is strongly associated with the development of psychopathology (Ormel et al.,

2012) which itself is negatively related to academic performance (Sijtsema et al., 2014).

Individuals scoring high in this trait are often labeled as emotionally instable, hence why

neuroticism is also called emotional stability. The effects of neuroticism are discussed in the

moderator section.

Extraverted individuals are described as outgoing, experiencing more positive

emotions, they tend to get gratification from outside themselves and get along well and like to

work together with other people. Therefore, they are less likely to be alone because they look

for contact to other people and seek social support in difficult situations. They are also less

likely to feel lonely which is one of the biggest predictors for dropping out of university or

school (Somoray et al., 2017).

Previous research among mental health workers showed that extraversion positively

and neuroticism negatively related to professional quality of life while extraversion negatively

and neuroticism positively related to burnout rates (Somoray et al., 2017). Another study that

looked at social relationships and personality in the transition into adulthood in students,

found that changes in emotional closeness are related to neuroticism for stable relationships

while the effect on unstable relationships was found for extraversion and emotional closeness

(Wagner et al., 2014). More specifically, as young people are becoming more mature, they also become more emotional stable and feel closer emotionally to others than less stable individuals, so high in neuroticism. More extraverted individuals have emotionally closer relationships, but maintenance of these relationships is not related to changes in extraversion while this is the case for neuroticism. In addition, extraversion positively predicts network sizes.

Previous research also showed that personality similarity in extraversion results in positive initial dyadic interactions between students. So that an extraverted actor would like to have more contact with their extraverted partner in the future rather than with an introverted partner and vice versa (Cuperman & Ickes, 2009). On the other side, a previous study found that personality heterophily over time predicted forming of relationships. This means that someone with a proactive personality rather forms relationships over time with people who are dissimilar in their personality style (Lee at al., 2014).

I hypothesize that perceived dissimilarity in personality has a negative influence on perceived academic performance. (H2)

Perceived Dissimilarity, Sense of Belonging and Academic Performance

Maslow (1958) already proposed half a century ago that sense of belonging is a basic human need that involves acceptance, involvement and support from others we feel belonging to. Feeling that you belong to a group can buffer against many adverse effects relating to feelings of depression and loneliness and therefore is important for social and psychological functioning (Hagerty et al., 1996). Connections and groups are formed by deep-level and also surface-level similarities such as sharing the same political ideology, active lifestyle or the same ethnicity (Lee et al., 2014). This means that students who are dissimilar to the majority of students or groups are less likely to feel belonging because they do not share the same characteristics or values as other students (Lane and Gibbons, 2007; Wurster et al., 2021).

Perceiving oneself as similar to the intragroup and having quality interpersonal bonds can lead to a higher sense of belonging in social categories groups. Social categories groups are abstract collectives formed by stereotypes, norms, and perceived homogeneity. This means that they are mostly formed based on surface-level similarity and partly deep-level similarity. In university for example this can be groups that form at first contact by surface-level similarities like ethnicity (Easterbrook & Vignoles, 2013). Previous research about person-environment fit (Suhlmann et al., 2018) found that high person-environment fit lead to higher sense of belonging which in turn increased motivation and decreased drop-out intention.

Research in the workplace (Kim et al., 2019) explicitly shows that also dissimilarity in ethnicity leads to frustrated belonging motive which in turn leads to decreased organizational attachment. This means that employees who perceive themselves as dissimilar in ethnicity to the majority of the group feel like they do not belong, hence their belonging motive is frustrated. This effect also applies to class participation and satisfaction of group membership for business school students (Kim et al., 2019). Ethnicity based discrimination affects student's well-being and sense of belonging which again negatively impacts academic performance which was been shown by multiple studies (Brannon & Lin, 2020). Furthermore, it was found that sense of belonging increases interaction between international and domestic students and in turn also increased academic performance by international students significantly (Glass & Westmont, 2014).

Taken together these findings highlight how detrimental a low sense of belonging can be to academic performance and how different sources of perceived dissimilarities can contribute to this effect. Our third hypothesis concentrates on the mediation of sense of belonging. I hypothesize that the relationship between perceived dissimilarities academic performance is mediated by sense of belonging (H3).

Neuroticism as Moderator between Perceived dissimilarity and Perceived Academic

Performance.

The effects of neuroticism in the academic setting were studied extensively yielding

mixed results. Previous research (Zanon et al., 2019) showed that neuroticism influenced the

personal experience dimension of academic adaptation. Furthermore, neuroticism was

negatively correlated with career and institutional adaptation dimensions which means that

individuals high in neuroticism had less satisfactory experiences in the process of adaptation

to the institution. In contrast, previous research shows that neuroticism can have a positive

effect on academic performance related to language courses and practical courses like craft or

music while a small negative correlation was found for sport courses (Rosander, Bäckström &

Stenberg 2011). Similarly, another study found a positive relationship between neuroticism

and grades three years later in upper secondary school students. The authors speculate that

this is possibly due to of the fear of failure generated by the neuroticism facets of

vulnerability and anxiety (Rosander & Bäckström, 2014). Contrary, a study with university

students found a weak negative relationship for neuroticism and academic performance

measured by exams and coursework (Furnham et al., 2013) where test anxiety generated by

neurotic personality was mentioned as one of the factors leading to poorer academic

performance (Chamorro-Premuzic et al., 2008).

Although there seems to be a weak to moderate relationship for neuroticism and

academic performance, due to the contrasting findings the direction remains to be

established. Looking at the relationship of perceived dissimilarity and neuroticism the

direction is clearer, for example researchers studying neuroticism in the workplace (Moss et

al., 2007) found that individuals high in neuroticism perceive themselves different from

applicants in the traits of extraversion and agreeableness. This relationship was explained by

an increased sensitivity to threat for neurotic participants. A dissimilarity in personality is

perceived as threatening in this case. Research by Lane and Gibbons (2007) described how a high degree of perceived dissimilarity to the prototypical student that is viewed favorably, can lead to worse academic performance only for individuals scoring high in neuroticism. The authors propose that students distance themselves from others when they compare themselves to the 'good' student and perceive a high degree of dissimilarity. This study highlights the impact perceived dissimilarity can have for neurotic individuals.

I expect that if an individual experiences a lot of negative emotions, it is more likely that perceived dissimilarities have a negative effect on academic performance. Therefore, my fourth hypothesis is that the relationship between perceived dissimilarity and academic performance is stronger for students high in neuroticism, such that neuroticism moderates the relationship. (H4)

Figure 1

Hypothesized Research Model
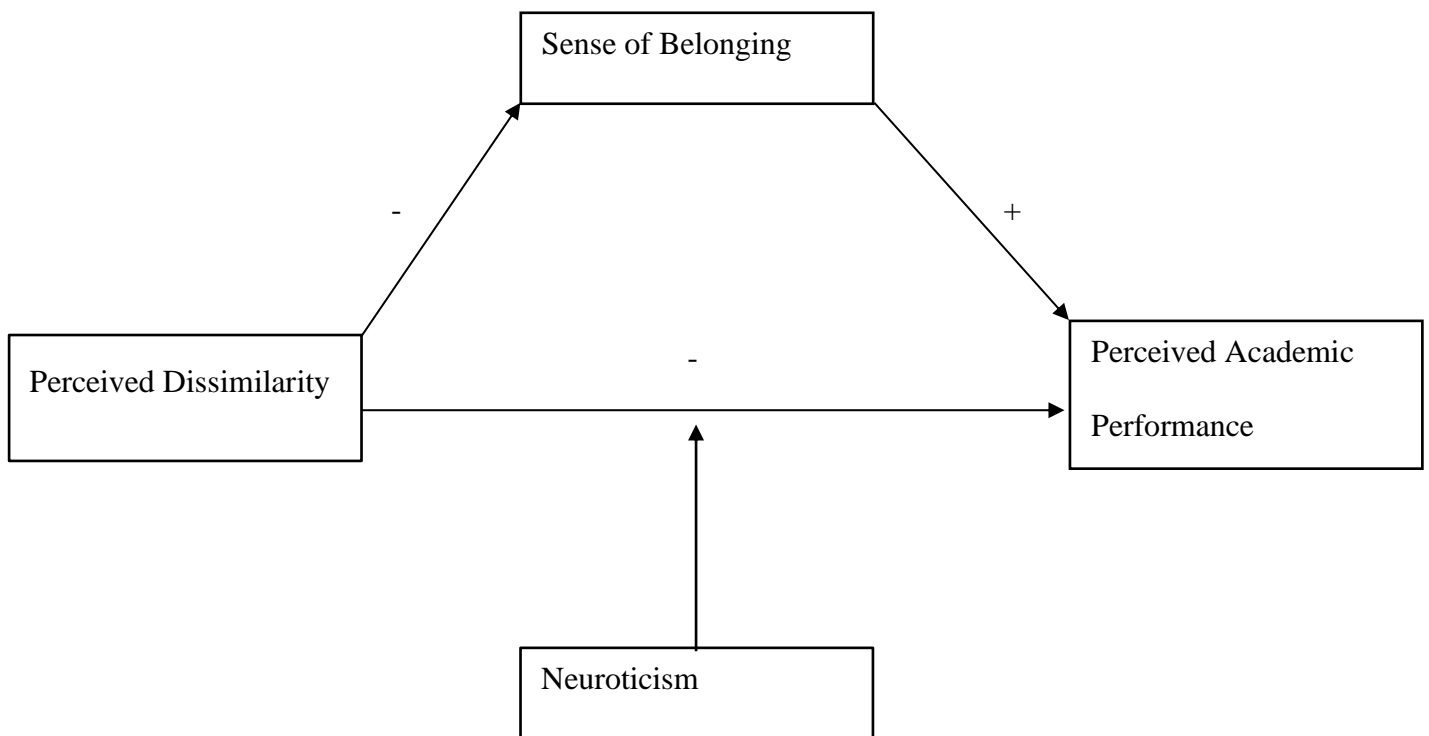
Methods

Participants

In total 128 participants completed the questionnaire consisting of 50 questions (84 females, 23 males, 1 prefer not to say, $M_{Age} = 20$, $SD = 2$). All the participants are students of the Rijksuniversiteit Groningen and part of either the Dutch or international bachelor psychology program. 93 Students from the first year, 20 from the second year and 14 students from the third/final year of education completed the questionnaire provided that they are actively enrolled in the Psychology bachelor program. Dutch and German students make up the majority of the participants with $n = 84$ and $n = 24$ respectively. Other nationalities like Slovak and Spanish are also represented with $n = 20$ for other.

Measures

After consenting to take part in the study, participants demographics were recorded including nationality, gender and age. Additionally, participants were asked for their year of study, sexuality with the option "prefer not to say" and whether they are part of the English or Dutch psychology track. All following questions were scored on a 5-point Likert scale but with different meanings relating to the scoring.

Perceived Dissimilarity

We assessed participants perceived dissimilarity both deep- and surface-level with three adapted items from Sahin et al. (2019). To assess surface-level dissimilarity we asked students to indicate to what extent they agreed with the statement "In terms of visible characteristics (e.g., sex, age, gender), I am different from most other students in the psychology program". To assess deep-level dissimilarity an item was stated as "In terms of invisible characteristics (e.g., values, attitude, personality, beliefs), I am different from most other students in the psychology program". For surface-level and deep-level dissimilarity items we got a Cronbach's alpha of α=.64. Scoring was done with a 5-point Likert scale (1= *definitely not,* 5= *definitely* yes).

For my individual focus of deep-level perceived dissimilarity, I used alternated versions of the items from the TIPI developed by Gosling, Rentfrow & Swann (2003). Participants were asked to what extent they agreed with two statements on emotional stability and two statements on extraversion. One item for each trait was reverse coded. An example item for extraversion is, "I see myself as more extraverted than most other students in the psychology program" and for emotional stability "I see myself as more anxious compared to most other students in the psychology program". We got an alpha of α=.64. These items were scored on a 5-point Likert scale ranging from 1= *strongly disagree* to 5= *strongly agree*.

Sense of Belonging

For measuring sense of belonging, we used five items from Williams, Hirschi, Sublett, Hulleman & Wilson (2020). Items included questions like "I feel safe being part of the psychology program" and "I am happy to be going to this psychology program". Scoring was done on a 5-point Likert scale ranging from 1= *definitely false* to 5= *definitely true*. We calculated an alpha of α=.74.

Perceived Academic Performance

We assessed perceived academic performance with four items for perceived academic performance from Hsioa et al. (2017), with a Cronbach's alpha of α=.86. Students were asked to what extent they agreed with statements such as "I am confident in my academic and learning abilities" or "I do well at university". The items were scored on a 5-point Likert scale (1= *strongly disagree*, 5= *strongly agree*).

Neuroticism

To assess neuroticism, we used five items from the 20-item scale for neuroticism of the IPIP NEO-PI-R scale (Costa & McCrae, 1992), for which we got a Cronbach's alpha of α=.80. Students were asked to indicate to what extent they agreed to statements such as "I am

filled with doubts about things" as well as reverse coded questions like "I seldom feel blue".

Responses were scored on a 5-point Likert scale (1= *very inaccurate*, 5= *very accurate*).

Research Design and Procedure

Most participants completed the questionnaire online via the SONA study system and received course relevant credits for participation for compensation. Other participants were recruited via social networks or online via Facebook or Whatsapp groups and completed the questionnaire via Qualtrics without any compensation. Completion of the questionnaire took about 5-10 minutes and was done after the participants received the instructions and agreed to the informed consent. Ethical approval for this study was granted by the Ethical Committee Psychology (ECP) affiliated with the University of Groningen, Netherlands. Informed consent was obtained from all participants included in the study. The constructs measured in this questionnaire are perceived deep level and surface level dissimilarity, perceived academic performance and the mediator sense of belonging. The focus and possible moderator in my work lies in personality. The constructs measured in this case are perceived dissimilarity in extraversion and emotional stability and a scale assessing neuroticism.

Results

Table 1 provides an overview of the correlations we found between each construct. It is noticeable that sense of belonging has a relatively high mean of $M = 3.96$ and the lowest standard deviation $SD = .56$. This suggests that overall, most students feel belonging without much variation between the students. Also interesting is that the lowest means as well as the highest standard deviations are found for perceived dissimilarity. For perceived dissimilarity in personality this is $M = 2.85$ with $SD = .81$ and for the surface-level item $M = 2.33$ and $SD = 1.13$. It seems that generally students did not perceive themselves as much different, but this also varies to quite some extent. The mean for neuroticism is a medium $M = 3.12$ with $SD = .86$. This means that in general students seem to be rather neurotic but not a great extent

although there is a lot of variation looking at the standard deviation which is the highest of all constructs. Lastly, perceived academic performance also had a relatively high mean $M = 3.68$ and the second largest standard deviation $SD = .82$. This means that on average students perceive themselves as doing good at the university and believing in their academic abilities while there is some variation among the students. Looking at the correlations, we have significant correlations for every expected relationship (see Figure 1) except for perceived surface-level dissimilarity which only has one significant correlation to sense of belonging ($r = -.182, p = <.05$). We can carry out a mediation analysis.

First, we will conduct the assumption checks. We will check for the assumptions of uncorrelated residuals by calculating the Durbin-Watson statistic and absence of multicollinearity by calculating variance inflation factors (VIF). To check for the assumption of homoscedasticity we will create a residual scatterplot and a histogram to check for normality. Additionally, we create a partial regression plot to check for the assumption of linearity. Lastly, we also check for outliers. Next, to examine whether deep-level dissimilarities have an impact on perceived academic performance and not surface-level dissimilarity, we will conduct a multiple linear regression. In examining the effect of perceived dissimilarity in personality on perceived academic performance we will conduct a simple linear regression. For our third hypothesis that the relationship between perceived dissimilarity and perceived academic performance is mediated by sense of belonging we will conduct a mediation analysis. To examine Hypothesis 4, we will conduct a moderation analysis.

The Durbin-Watson value = 2.216 indicates that the assumption of uncorrelated residuals is not violated. Additionally, the assumption of multicollinearity was not violated indicated by the VIF's which were all below $VIF = 2$. Perceived dissimilarity in personality has the highest $VIF = 1.940$ and sense of belonging has the lowest $VIF = 1.140$. The

assumptions of homoscedasticity and linearity were also not violated which can be seen by looking at the plots (see Figure 2 and Figure 3 in Appendix). The assumption of normality was also not violated which ca be seen by looking at the histogram (see Figure 4 in Appendix). We had one outlier for perceived academic performance which can be seen in the histogram but analyses with and without the outlier did not differ in a significant way, so we kept the observation in the analysis as this person probably reported genuinely, looking at the other responses.

Because the perceived deep-level dissimilarity items from Sahin yield lower correlations than my perceived dissimilarity in personality scale I will use my items for all further analyses.

Table 1

Pearson Correlations for all constructs

Variables	PercDP	PercD	SoB	PAP	Neuroticism	Age
PercDP	1	-.110	.300**	.334**	-.662**	-.230**
PercD	-.110	1	-.204*	-.032	.169	.195*
SoB	.300**	-.204*	1	.326**	-.316**	-.081
PAP	.334	-.032	.326**	1	-.397**	.038
Neuroticism	-.662**	.169	-.316**	-.397**	1	.119
Age	-.230**	.195*	-.081	.038	.119	1

Note: PAP: Perceived Academic Performance, SoB: Sense of Belonging, PercD: Perceived Dissmilarity; PercDP: Perceived Dissimilarity in Personality. * indicates $p < .05$. ** indicates $p < .01$.

Perceived Surface-Level and Deep-Level Dissimilarity on Perceived Academic Performance

To examine the effect of deep-level dissimilarity and surface-level dissimilarity on academic performance we conducted a multiple regression analysis. The results show that there was significant collective effect for deep and surface-level dissimilarity ($F(2,122) =$ 7,842, $p <$.001, $R^2 =$ .114). Further examination of the individual predictors revealed that deep-level dissimilarity was a significant predictor for the model ($t = 3.784, p < .000$) while surface-level dissimilarity was not ($t = -.605, p = .546$). Therefore, we can conclude that Hypothesis 1 is supported.

Effect of Perceived Dissimilarity in Personality on Perceived Academic Performance

To examine whether perceived dissimilarity had an effect on perceived academic performance we conducted a simple linear regression. We found a significant effect for perceived dissimilarity predicting sense of belonging ($F(1,123) = 9,236$ $p <$.001, $R^2 =$ .11). We conclude that Hypothesis 2 is supported.

Sense of Belonging as Mediator between Perceived Dissimilarity and Perceived Academic Performance

Next, we carried out a mediation analysis to examine whether sense of belonging functions as a mediator in our model between perceived dissimilarity and academic performance. In step 1 of the mediation analysis we can see that perceived dissimilarity is a significant predictor for our mediator variable sense of belonging $b =$ .212, $se =$ .06, $95\% CI$[.094, .323], $\beta =$ .306, $p = <$.001. In step 2 sense of belonging was a significant predictor of academic performance at $b =$ .361, $se =$ .127, $95\% CI$[.109, .614], $\beta =$ .247, $p =$ $<$.01. Step 3 shows that perceived dissimilarity is still a significant predictor for perceived academic performance after controlling for sense of belonging $b =$ .261, $se =$ .089, $95\% CI$[.087, .436], $\beta =$ .259, $p = <$.01. Approximately 17% of the variance was accounted for by the predictors ($R^2 =$ .167) Step 4 of the mediation analysis reveals an indirect effect of our mediator variable *effect =* .076, *SE =* .034, 95% *CI*[.02, 152]. To check whether this

effect shows a mediation we performed a sobel-test ($z = 2.27$, $p = .002$). Sense of belonging
mediated the relationship between perceived dissimilarity and academic performance, hence
hypothesis 3 is supported.

**Neuroticism Moderating the Relationship between Perceived Dissimilarity and
Perceived Academic Performance**

Using the standard moderation model, we found no moderation of neuroticism on the
relationship between perceived dissimilarity and academic performance with the interaction
effect being non-significant $b = -.078$, $t(117) = -.7662$, $p = .445$. The addition of the
moderator to the IV-DV model did not show a significant change ($F(1,117) = .587$, $p = .445$,
R^2 change $= .004$). Because neuroticism showed high significant correlations with our
variables of interest, a subsequent exploratory analysis was carried out. I conducted a
mediation analysis with neuroticism as the independent variable. In step 1 of the mediation
analysis we can see that neuroticism is a significant predictor for the mediator variable sense
of belonging $b = -.199$, $se = .06$, $95\% CI[-.309, -.089]$, $\beta = -.314$, $p = <.001$. In step 2 sense of
belonging was a significant predictor of academic performance at $b = .384$, $se = .127$,
$95\% CI[.127, .640]$, $\beta = .255$, $p = .004$. Step 3 shows that neuroticism is still a significant
predictor for perceived academic performance after controlling for sense of belonging $b = -$
$.303$, $se = .082$, $95\% CI[-.466, -.140]$, $\beta = -.318$, $p = <.001$. Approximately 22% of the
variance was accounted for by the predictors ($R^2 = .217$) Step 4 of the mediation analysis
reveals an indirect effect of our mediator variable *effect* $= -.076$, $SE = .034$, 95% $CI[-.154, -$
$.02]$. To check whether this effect shows a mediation we performed a sobel-test ($z = -2.30$, p
$= .002$).

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Discussion

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We investigated the effects of perceived dissimilarity on sense of belonging and
academic performance. According to the literature we presented, perceived dissimilarity

negatively impacts sense of belonging (Kim, Ormiston, Easterbrook & Vignoles, 2019) as

well as academic performance (Lane & Gibbons, 2007) while sense of belonging positively

influences academic performance (Glass & Westmont, 2014). Our study results are partly in

line with the literature. Perceived dissimilarity as measured by the items from Sahin et al.

(2019), was not significantly related to our outcome measures. In line with our hypothesis

(H3) sense of belonging was a significant positive predictor of academic performance and

mediated the relationship between perceived dissimilarity in personality and perceived

academic performance.

We found support for hypothesis 1 in that perceived deep-level dissimilarity and not

surface-level dissimilarity predicted academic performance. This finding implies that

differences between the students in easily observable features such as age, gender and

ethnicity do not significantly impact the way students perceive their academic performance.

An explanation of this findings could be that most students are relatively open coming to

university and expect some degree of diversity already regarding these characteristics

(Ludeke, 2014).

Hypothesis 2 which stated that perceived dissimilarity in personality has an impact on

perceived academic performance was supported. Contrary to expectations, this relationship

was positive. This means that when students perceived a lot of differences in extraversion and

neuroticism between them and other students, they felt more belonging. These results are

consistent with the findings of Cuperman and Ickes (2009) regarding dissimilarity in

extraversion but contrary to the findings of Moss et al. (2007). An explanation could be that

students perceive dissimilarity in personality rather in a positive way, so if they perceive

themselves as more emotional stable and more outgoing than other students it has a positive

effect on their sense of belonging and perceived academic performance.

Hypothesis 3 was also supported. Sense of belonging mediated the relationship between perceived dissimilarity and academic performance. More specifically, higher perceived dissimilarity leads to higher sense of belonging which in turn leads to higher perceived academic performance. This finding may be explained by the idea that students who perceive themselves as different in personality in a positive way they also feel more belonging. If students feel belonging, they also have more positive input for perceiving themselves in a more positive way concerning their academic performance. There is probably also more exchange between students or social support that makes them less likely to feel bad if they do not get 'good' grades.

It should also be noted that there was a significant negative correlation between perceived surface-level dissimilarity and sense of belonging which points to the possibility that even differences in easily observable features can have an impact on sense of belonging. This is in accordance with research by Kim et al. (2019). This effect can possibly be bigger for students who came into the university during the corona pandemic and did not have much actual contact.

Lastly, we did not find any support for Hypothesis 4. Against our expectations neuroticism did not moderate the relationship between perceived dissimilarity and sense of belonging for perceived dissimilarity in personality. Nevertheless, the significant correlations with our outcome variables point to the possibility that high neuroticism in students can have detrimental effects for sense of belonging as well as perceived academic performance. The exploratory analysis supports the idea that the higher students are in neuroticism, the less they feel belonging which in turn also decreases their perceived academic performance. This finding is supported by research from DeShong et al. (2015).

Limitations

Our study has several limitations that make these results to be interpreted with caution, we will discuss four main points. First of all, our sample was relatively uniform. We only included students from the bachelor psychology program of our university and our sample mean age was very low because most participants were first-year students. Even though some other nationalities were included, a large proportion of our sample was Dutch or German. Taken together these conditions make it difficult to apply our findings to other countries, age groups or other contexts.

Second, to be mindful of total participation-duration we shortened scales to only two to five items which calls into question the reliability of the scores for the constructs we tried to measure. Especially big constructs like personality are hard to measure with just a few items reliably which can be seen by the Cronbach alphas for perceived dissimilarity in personality as well as the items from Sahin et al. (2019).

A third limitation that warrants comment is that many results that we based our hypotheses on are from contexts regarding the workplace and may not be applicable to the university context. This may explain why for example our perceived dissimilarity to perceived academic performance results did not meet our expectations. In this respect more research is needed in the student population regarding our factors perceived dissimilarity and sense of belonging and academic performance.

Fourth, research is relatively sparse on perceived academic performance as mostly grades are assessed to gauge academic performance. We used this as our outcome measure because we propose that perceived academic performance is an interesting alternative to grades in assessing the effect of perceived dissimilarity as both these constructs rely on the evaluation of the students themselves. However, we cannot conclude that our findings can be transferred to academic performance as traditionally measured by grades or academic motivation.

Theoretical and Practical Implications

There are several important theoretical and practical implications to our study. First of all, surface-level had only small or no effects on our outcome measures which supports the idea that differences in observable features such as age and gender do not have a significant impact on sense of belonging and perceived academic performance. This suggests that future research can more closely focus on deep-level dissimilarities although this does not rule out effects of surface-level dissimilarity in specific contexts such as initial contacts between students.

Secondly, it makes a difference how perceived dissimilarities are measured because it can change the direction the relationship takes to sense of belonging as well as perceived academic performance. Sahin et al. (2019) items were negatively correlated to perceived academic performance, but this correlation was non-significant while items for perceived dissimilarity in personality had a positive significant correlation with academic performance. Although again there is not much literature of perceived dissimilarity on academic performance these results make it clear that it is important to carefully consider how to measure perceived dissimilarity. It is possible that some deep-level dissimilarities are perceived as positive while other deep-level dissimilarities are perceived as rather unpleasant.

The results that we found for sense of belonging point to a clearer direction. It seems that sense of belonging plays an important role in predicting perceived academic performance as our literature review also showed. This means that future research should take a closer look on what factors can influence sense of belonging also in the student population by for example examining effects of perceived dissimilarity of the univ

Lastly, the effects that we found show that although not necessarily having a moderating effect, high scores in neuroticism lead to lower scores in sense of belonging and also perceived academic performance. This is important in that a closer look should be taken

at students high in neuroticism and their development at university which should also be taken on by future research.

From a practical standpoint our research suggests that universities need to ensure that students feel that they belong. There are several ways interventions can be implemented, for example poster campaigns that highlights the similarities in students' lives and struggles that connects students in some way. Another intervention includes invitations to social gathering for students from different faculties and programs or more advertised university activities that are open to join for everyone. Lastly, universities can more closely monitor for students high in neuroticism, with a small personality measure in the admission process for example. By this procedure they can make sure that students who are vulnerable can get support to feel more belonging.

Conclusion

All in all, our study adds interesting findings especially on the role of sense of belonging on perceived academic performance and the way personality traits such as neuroticism have some impact in this relationship. A sense of belonging is a vital component for students to reach their goals at the university and feel like they are able to accomplish something in their study process. Therefore, we need to take care for students to feel belonging to their fellow peers, program and university especially if they are vulnerable such as students high in neuroticism. Even when dissimilarities are high or low, we need to ensure that students can receive a sense of belonging from interactions with other students. Increasing their sense of belonging may also be achieved by the way they are approached at the university in lectures or generally in contact with staff members of the university.

References

Chamorro-Premuzic, T., Ahmetoglu, G., & Furnham, A. (2008). Little more than personality:

Dispositional determinants of test anxiety (the Big Five, core self-evaluations, and

self-assessed intelligence). *Learning and Individual Differences*, *18*(2), 258–263.

https://doi-org.proxy-ub.rug.nl/10.1016/j.lindif.2007.09.002

Costa, P. T., & McCrae, R. R. (1992). Normal personality assessment in clinical practice: The

NEO Personality Inventory. *Psychological Assessment*, *4*(1), 5–13. https://doi-

org.proxy-ub.rug.nl/10.1037/1040-3590.4.1.5

Cunningham, G.B. Perceptions As Reality: The Influence of Actual and Perceived

Demographic Dissimilarity. *Journal of Business and Psychology 22*, 79–89 (2007).

https://doi-org.proxy-ub.rug.nl/10.1007/s10869-007-9052-y

Cuperman, R., & Ickes, W. (2009). Big Five predictors of behavior and perceptions in initial

dyadic interactions: Personality similarity helps extraverts and introverts, but hurts

"disagreeables." *Journal of Personality and Social Psychology*, *97*(4), 667–684.

https://doi-org.proxy-ub.rug.nl/10.1037/a0015741

DeShong, H. L., Tucker, R. P., O'Keefe, V. M., Mullins-Sweatt, S. N., & Wingate, L. R.

(2015). Five factor model traits as a predictor of suicide ideation and interpersonal

suicide risk in a college sample. *Psychiatry Research*, *226*(1), 217–223. https://doi-

org.proxy-ub.rug.nl/10.1016/j.psychres.2015.01.002

Easterbrook, M., & Vignoles, V. L. (2013). What does it mean to belong? Interpersonal bonds

and intragroup similarities as predictors of felt belonging in different types of

groups. *European Journal of Social Psychology*, *43*(6), 455–462.

Furnham, A., Nuygards, S., & Chamorro-Premuzic, T. (2013). Personality, assessment

methods and academic performance. *Instructional Science*, *41*(5), 975–987.

https://doi-org.proxy-ub.rug.nl/10.1007/s11251-012-9259-9

Glass, C. R., & Westmont, C. M. (2014). Comparative effects of belongingness on the

academic success and cross-cultural interactions of domestic and international

students. *International Journal of Intercultural Relations*, *38*, 106–119. https://doi-

org.proxy-ub.rug.nl/10.1016/j.ijintrel.2013.04.004

Gosling, S. D., Rentfrow, P. J., & Swann, W. B., Jr. (2003). A very brief measure of the Big-

Five personality domains. *Journal of Research in Personality*, *37*(6), 504–528.

https://doi-org.proxy-ub.rug.nl/10.1016/S0092-6566(03)00046-1

Guerin, C., & Green, I. (2016). Cultural diversity and the imagined community of the global

academy. *Asia Pacific Journal of Education*, *36*(1), 1–12. https://doi-org.proxy-

ub.rug.nl/10.1080/02188791.2014.922048

Hagerty, B. M., Williams, R. A., Coyne, J. C., & Early, M. R. (1996). Sense of belonging and

indicators of social and psychological functioning. *Archives of Psychiatric

Nursing*, *10*(4), 235–244. https://doi-org.proxy-ub.rug.nl/10.1016/S0883-

9417(96)80029-X

Harms, P. D., Roberts, B. W., & Winter, D. (2006). Becoming the Harvard Man: Person-

Environment Fit, Personality Development, and Academic Success. *Personality and

Social Psychology Bulletin*, *32*(7), 851–865. https://doi-org.proxy-

ub.rug.nl/10.1177/0146167206287720

Kacmar, K. M., Harris, K. J., Carlson, D. S., & Zivnuska, S. (2009). Surface-level actual

similarity vs deep-level perceived similarity: Predicting leader-member exchange

agreement. *Journal of Behavioral and Applied Management*, *10*(3), 315–334.

https://doi-org.proxy-ub.rug.nl/10.21818/001c.17263

Kim, K., Ormiston, M. E., Easterbrook, M. J., & Vignoles, V. L. (2019). Ethnic dissimilarity

predicts belonging motive frustration and reduced organizational attachment. *Group*

Processes & Intergroup Relations, *22*(1), 116–138. https://doi-org.proxy-
ub.rug.nl/10.1177/1368430217733116

Lane, D. J., & Gibbons, F. X. . (2007). Am I the typical student? Perceived similarity to
student prototypes predicts success. *Personality and Social Psychology
Bulletin*, *33*(10), 1380–1391. https://doi-org.proxy-
ub.rug.nl/10.1177/0146167207304789

Lee, S. H. (Mark), Qureshi, I., Konrad, A. M., & Bhardwaj, A. (2014). Proactive personality
heterophily and the moderating role of proactive personality on network centrality and
psychological outcomes: A longitudinal study. *Journal of Business and
Psychology*, *29*(3), 381–395. https://doi-org.proxy-ub.rug.nl/10.1007/s10869-013-
9320-y

Liao, H., Chuang, A., & Joshi, A. (2008). Perceived deep-level dissimilarity: Personality
antecedents and impact on overall job attitude, helping, work withdrawal, and
turnover. *Organizational Behavior and Human Decision Processes*, *106*(2), 106–124.
https://doi-org.proxy-ub.rug.nl/10.1016/j.obhdp.2008.01.002

Ludeke, S. G. (2014). Truth and fiction in the association between Openness and education:
The role of biased responding. *Learning and Individual Differences*, *35*, 137–141.
https://doi-org.proxy-ub.rug.nl/10.1016/j.lindif.2014.07.008

Maslow, A. H. (1958). A Dynamic Theory of Human Motivation. In C. L. Stacey & M.
DeMartino (Eds.), *Understanding human motivation.* (pp. 26–47). Howard Allen
Publishers. https://doi-org.proxy-ub.rug.nl/10.1037/11305-004

Moss, S. A., Garivaldis, F. J., & Toukhsati, S. R. (2007). The perceived similarity of other
individuals: The contaminating effects of familiarity and neuroticism. *Personality and
Individual Differences*, *43*(2), 401–412. https://doi-org.proxy-
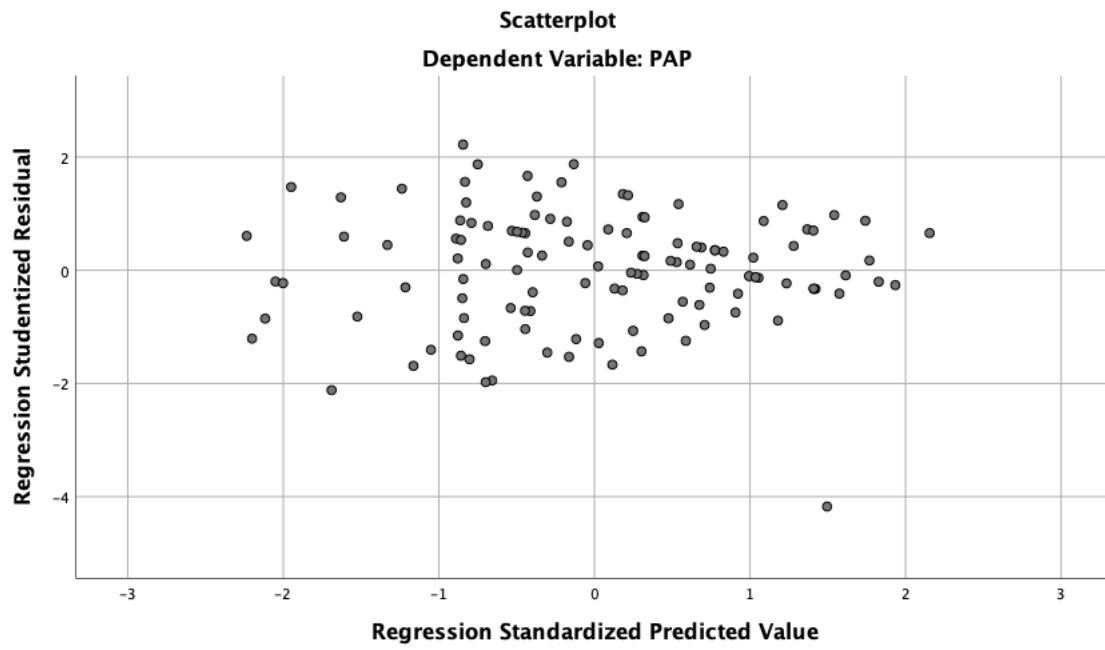ub.rug.nl/10.1016/j.paid.2006.12.008

Ormel, J., Riese, H., & Rosmalen, J. G. M. (2012). Interpreting neuroticism scores across the

adult life course: Immutable or experience-dependent set points of negative

affect? *Clinical Psychology Review*, *32*(1), 71–79. https://doi-org.proxy-

ub.rug.nl/10.1016/j.cpr.2011.10.004

Rosander, P., Bäckström, M., & Stenberg, G. (2011). Personality traits and general

intelligence as predictors of academic performance: A structural equation modelling

approach. *Learning and Individual Differences*, *21*(5), 590–596. https://doi-org.proxy-

ub.rug.nl/10.1016/j.lindif.2011.04.004

Rosander, P., & Bäckström, M. (2014). Personality traits measured at baseline can predict

academic performance in upper secondary school three years late. *Scandinavian

Journal of Psychology*, *55*(6), 611–618. https://doi-org.proxy-

ub.rug.nl/10.1111/sjop.12165

Sijtsema, J. J., Verboom, C. E., Penninx, B. W. J. H., Verhulst, F. C., & Ormel, J. (2014).

Psychopathology and academic performance, social well-being, and social preference

at school: The TRAILS study. *Child Psychiatry and Human Development*, *45*(3), 273–

284. https://doi-org.proxy-ub.rug.nl/10.1007/s10578-013-0399-1

Somoray, K., Shakespeare, F. J., & Armstrong, D. (2017). The impact of personality and

workplace belongingness on mental health workers' professional quality of

life. *Australian Psychologist*, *52*(1), 52–60. https://doi-org.proxy-

ub.rug.nl/10.1111/ap.1218

Stevens, C., Liu, C. H., & Chen, J. A. (2018). Racial/ethnic disparities in US college students'

experience: Discrimination as an impediment to academic performance. *Journal of

American College Health*, *66*(7), 665–673. https://doi-org.proxy-

ub.rug.nl/10.1080/07448481.2018.1452745

Suhlmann, M., Sassenberg, K., Nagengast, B., & Trautwein, U. (2018). Belonging mediates

    effects of student-university fit on well-being, motivation, and dropout

    intention. *Social Psychology*, *49*(1), 16–28. https://doi-org.proxy-

    ub.rug.nl/10.1027/1864-9335/a000325

van Emmerik, I. J. H., & Brenninkmeijer, V. (2009). Deep-level similarity and group social

    capital: Associations with team functioning. *Small Group Research*, *40*(6), 650–669.

    https://doi-org.proxy-ub.rug.nl/10.1177/1046496409346550

Wagner, J., Lüdtke, O., Roberts, B. W., & Trautwein, U. (2014). Who belongs to me? Social

    relationship and personality characteristics in the transition to young

    adulthood. *European Journal of Personality*, *28*(6), 586–603. https://doi-org.proxy-

    ub.rug.nl/10.1002/per.1974

Williams, C. L., Hirschi, Q., Sublett, K. V., Hulleman, C. S., & Wilson, T. D. (2020). A brief

    social belonging intervention improves academic outcomes for minoritized high

    school students. *Motivation Science*, *6*(4), 423–437. https://doi-org.proxy-

    ub.rug.nl/10.1037/mot0000175.supp (Supplemental)

Wurster, K. G., Kivlighan, D. M., III, & Foley-Nicpon, M. (2021). Does person-group fit

    matter? A further examination of hope and belongingness in academic enhancement

    groups. *Journal of Counseling Psychology*, *68*(1), 67–76. https://doi-org.proxy-

    ub.rug.nl/10.1037/cou0000437

Zanon, C., Araújo, A., & Hutz, C. S. (2019). The relevance of the Big Five Model to students'

    adaptation to the academic environment personality and academic
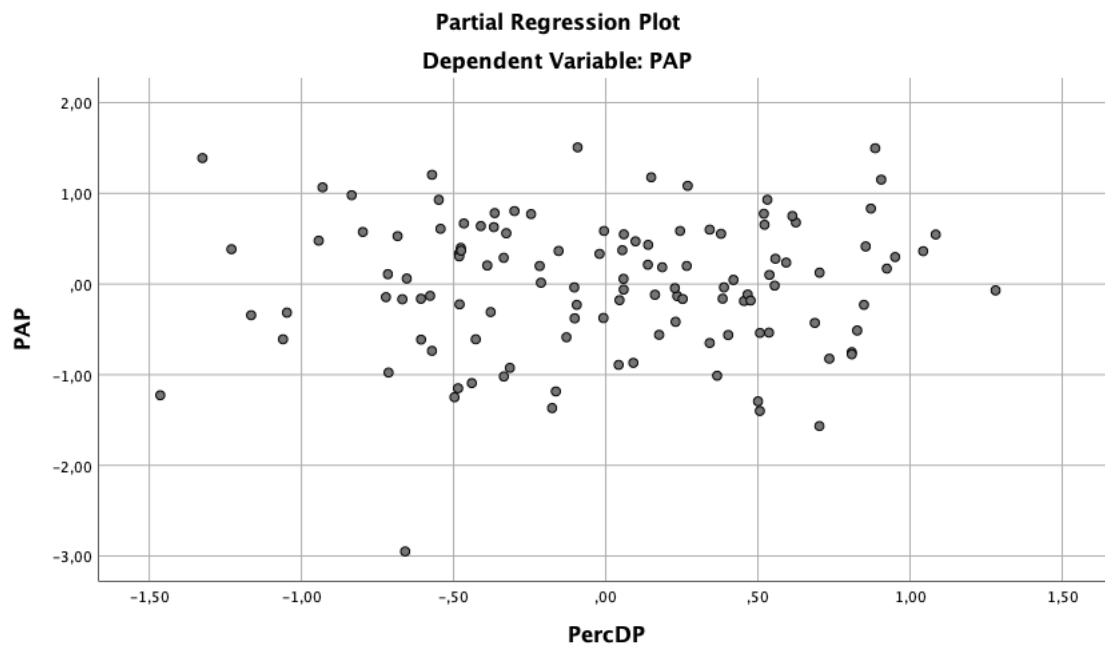
    experiences. *PSICO*, *50*(4). https://doi-org.proxy-ub.rug.nl/10.15448/1980-

    8623.2019.4.31599

Appendix A

Figure 2

Scatterplot of studentized residuals for PAP

Scatterplot
Dependent Variable: PAP

Note: This partial regression plot is used to check for homoscedesticity.

Figure 3

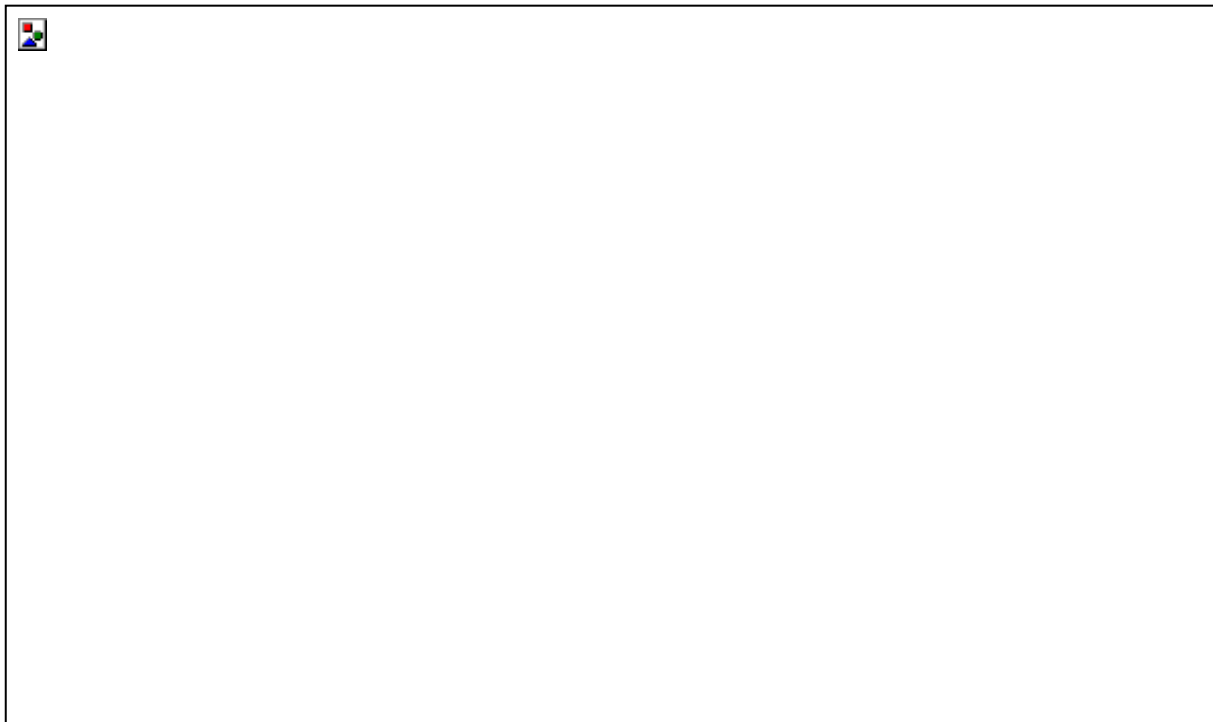*Partial Regression Plot for PercDP and PAP*

Partial Regression Plot
Dependent Variable: PAP

Note: This partial regression plot is used to check for linearity.

Figure 4

Histogram of Regression Standardized Residuals for PAP

Note: This histogram is used to check for normality, PAP: Perceived Academic Performance