

Hyperfocus and Motivational Predictors of Academic Motivation in university Students

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Abstract

The study investigated how the three cognitive motivators: the Need for cognition, intrinsic motivation, and epistemic curiosity, predict the frequency of the state of hyperfocus. The study also checks for any association between all the cognitive motivators tested in the study. In addition, the paper also looks at the existence of hyperfocus in non -ADHD patients. 375 participants, with a mean age of 19.76 years took part in the research by filling in the survey. The survey consisted of different scales. It was concluded that deprivation sensitivity and intrinsic motivation predicted the frequency of the state of hyperfocus. In addition, a positive correlation was found between all the cognitive motivators. However, the strength of each association between the cognitive motivators differed. The strengths, limitations, and future directions are discussed in the paper as well.

Hyperfocus and Motivational Predictors of Academic motivation in University Students

Introduction

Hyperfocus is a tendency to be occupied with a task for an extended period. It is a complex concept that is described in various ways. The most basic idea of hyperfocus remains that it is a phenomenon that reflects one's complete absorption in a task to the point where a person appears to completely ignore or tune out everything else (Ashinoff & Abu - Akel, 2019). People often tend to hyperfocus on something interesting they find (Langmaid, 2022). However, it is often spoken about in people with attention-deficit hyperactivity disorder, Schizophrenia, and Autism (Ashinoff & Abu -Akel, 2019). In various studies, hyperfocus is also often referred to as "flow" (Ashkinoff & Abu-Akel,2019). However, they both do not mean the same. Flow is an experience associated with learning motivation, performance, and positive effect (Júlia,2008). Both terms hold a very similar meaning but still differ in their way.

Specifically, one is in a state of hyperfocus when one experiences an enhanced attentional focus and diminished awareness of time and the environment (Groen et al., 2020). On the other hand, when experiencing flow, the activity they engage in is intrinsically rewarding, such that their end goal is just an excuse for the process (Csikszentmihalys, 2009). This depicts that one must be deeply involved in the task one performs for their own reward. Moreover, hyperfocus is often used in psychiatric literature, while positive psychology literature refers to the word flow (Ashinoff & Abu-Akel,2019). Furthermore, since hyperfocus is primarily talked about in patients with ADHD but also experienced by non-attention deficit hyperactivity disorder people (Langmaid,2022), there always remained a question about who experiences it more. Hupfeld et al . (2018) researched to know who experiences the state of hyperfocus more, patients with ADHD or non-ADHD

patients. It was found that people with ADHD experienced higher levels of hyperfocus than non-ADHD patients.

In addition, Groen et al. (2020) also studied the association between the frequency, duration, and pervasiveness of hyperfocus across different situations in adults with and without ADHD. They helped us understand the frequency of hyperfocus experienced by non-ADHD people. Their study showed that 82.7% of the people without ADHD indicated to have hyperfocus occurrences. This insinuates that hyperfocus in normal people is also very common. It helps people do many of their tasks briefly and be precise with their work (Ashinoff & Abu-Akel, 2019). Different factors lead to the state of hyperfocus. To understand the possible factors that lead to the highest frequency of hyperfocus, this research paper will look into three possible aspects: the Need for cognition, intrinsic motivation, and epistemic curiosity. From our understanding, these three factors are likely the leading causes for an individual to enter the state of hyperfocus.

Epistemic curiosity

Talking in depth about epistemic curiosity, the basic idea refers to the human motive to seek information or knowledge (Grossnickle, 2016; Kidd & Hayden, 2015). Furthermore, Shin and Kim (2019) state that the triggers for curiosity include incomplete information, associated with aversive feelings and seeking information to dissolve the aversive state. The scale used for curiosity is multi-dimensional. It looks into five scales deprivation sensitivity, stress tolerance, social curiosity, thrill-seeking, and the joyous deprivation scale. This paper will use the joyous deprivation scale and the deprivation sensitivity scale as they are highly associated with epistemic curiosity. Furthermore, when a person is inquisitive about some task, they are more likely to be fully absorbed in that task by thinking or learning about it. Consequently, there is a chance of a positive correlation between epistemic curiosity and experiencing the state of hyperfocus.

Intrinsic motivation

Another factor considered is intrinsic motivation and its association with hyperfocus. Firstly, intrinsic motivation is defined as doing an activity for its inherent satisfaction rather than some separable consequence (Ryan & Deci, 2000). A person is intrinsically motivated to perform a challenging task or to do something fun (Ryan & Deci, 2000). People who tend to perform a task with intrinsic motivation are not looking out for any external rewards or recognition but rather to obtain good results for their satisfaction and to gain knowledge. There are three types of intrinsic motivation: intrinsic motivation towards accomplishments (IM -to accomplish), intrinsic motivation to experience stimulation (IM to stimulate), and intrinsic motivation to know (IM-to know). In addition, intrinsic motivation is more related to attentional engagement in a task than extrinsic motivation (Ryan et al., 2000).

Need for cognition

The Need for cognition factor is an individual's tendency to engage in and enjoy effortful cognitive endeavours (Cacioppo et al.,1996). Individuals with a higher Need for cognition tend to have a positive attitude toward situations requiring reasoning and problem-solving (Cacioppo et al., 1996). Individuals prefer to perform specific tasks which are mentally challenging for them. An individual with the Need for cognition gets involved in a task with critical thinking. This may make them too absorbed in the task leading to a state of hyperfocus. It insinuates one's motivation to pay attention and focus on a task. Therefore, Need for cognition could be a factor leading to the frequent state of hyperfocus.

This research paper explores hyperfocus and motivating predictors of academic motivation in university students. Furthermore, it will also look into how epistemic curiosity, intrinsic motivation, and the Need for cognition increase the frequency of the state of hyperfocus. In addition, it will also test the association between hyperfocus and cognitive motivators.

Some studies have talked about hyperfocus, but only a few have looked into the motivating predictors which could be there. In order to obtain a better insight into this topic and have a clear understanding of the topic, the following two research questions will be addressed in the paper. Firstly, to what extent do the cognitive motivators: epistemic curiosity, intrinsic motivation, and the Need for cognition predict the frequency of the state of hyperfocus in university students? Secondly, how are the cognitive motivators associated with each other. Four hypotheses were formed to address these questions in detail and clearly. First, two hypotheses were formed to understand the association between epistemic curiosity and the frequency of hyperfocus: It is predicted that individuals with high Joyous exploration will experience a higher frequency of hyperfocus. Individuals with high Deprivation sensitivity will experience a higher frequency of hyperfocus. Second, individuals with high intrinsic motivation will have a higher frequency of hyperfocus. Third, individuals with a high need for cognition will have a higher frequency of hyperfocus. Furthermore, to understand the association between all the cognitive motivators, another hypothesis was formed: there is an association between all the cognitive motivators present in the study.

In this paper, we will look at the effect of hyperfocus on school students and try to understand its effect. It will be interesting to know about hyperfocus, and its association with the cognitive motivators of academic motivation in university students, as no research has been conducted to understand this association. It will also help us understand which cognitive motivators cause the most frequent state of hyperfocus.

Method

Participants

A convenience sample of bachelor students was gathered by advertising through social media, hanging flyers around the university, and SONA. Participants were selected

based on the inclusionary criteria: students in the first, second, or third year of the BSc of Psychology at the University of Groningen. Therefore, students of Master's and other bachelor's courses were part of the exclusionary criteria. The first-year students were only gathered using the SONA participant's pool. The second and third-year students were collected using social networks (such as WhatsApp) and fliers around the campus. Of the 394 participants who initially filled out the survey, 19 participants (4.82%) were removed because they did not meet the criteria, as 12 participants (3.05%) did not complete the entire questionnaire, six participants (1.52%) finished the survey in under ten minutes, and one participant (0.25%) failed to answer the bogus question. Therefore, our final sample consisted of 375 participants.

Moreover, the sample consisted of 88 male participants (23.57%), 258 female participants (76.0%), and two participants (0.53%) who preferred not to say their biologically assigned sex at birth. The average age of the participants was 19.76 years ($SD = 2.10$), while the minimum age of a participant was 17 years, and the maximum age of a participant was 35 years. Most of the participants in our sample were Dutch (49.87%). Also, 84 participants were German (22.4%), and 104 had a different nationality (27.73%). 88% of the participants had completed the upper secondary level of education ($n = 330$). All participants in the first year of their bachelor's degree (SONA participant pool) received SONA credits as an incentive. However, all other 10 participants, such as second and third-year students, were rewarded with an incentive of 1.5 euros.

Materials/Measures

The Hyperfocus in School Scale was used to measure the frequency of hyperfocus in the academic context. This questionnaire is a 12-item subscale of the Adult Hyperfocus Questionnaire (AHQ; Hupfeld et al, 2019) centered around hyperfocus in the context of school. Some examples of statements used in this questionnaire included ("Completely losing

track of time while doing work for the class.”; “Not noticing the world around you [e.g. not realizing if someone calls your name or if your phone buzzes] if you’re working on homework or studying.”). The Hyperfocus in School Scale originally made use of a six-point Likert scale ranging from ‘Never’ to ‘Daily’, in the adapted version a six-point Likert scale is used however it ranges from ‘Never’ to ‘Always/Daily’. Further differences relative to the original included a timeframe in the Likert scale, such as ‘Rarely / 1-2 times every 6 months’, ‘Sometimes 1-2 times per month’, ‘Often / Once a week’, and ‘Very often / 2-3 times a week’. The purpose of this modification was to ensure results of the AHQ were comparable with other outcome measures in the study. The scores in this scale were computed by calculating the sum of all the items present for a total score of 72. The original questionnaire had an additional instruction for participants to identify their favourite course and keep this in mind when answering the questionnaire (“What is your favourite course that you have taken so far in college? This could be a class that you are currently taking.”). In our study, we have omitted this to allow participants to generalize the questions to all university-related work. In the current sample, this scale had a Cronbach’s alpha of .87.

The Need for Cognition-6 (NCS-6, Coelho et al., 2020) questionnaire measured the amount of enjoyment people get from engaging in cognitively challenging activities. This is an 11 adapted version of the original Need for Cognition scale. The NCS-6 questionnaire is a six-item survey that uses a five-point Likert scale ranging from 1 (extremely uncharacteristic) to 5 (extremely characteristic). No changes were made to the original NCS-6 when it was used in our survey. The survey contained six statements about Need for Cognition (“Would prefer complex to simple problems.”, “I really enjoy a task that involves coming up with new solutions to problems.”); two of which were reverse-coded (“Thinking is not my idea of fun.”, “I would rather do something that requires little thought than something that is sure to

challenge my thinking abilities.”). This scale was calculated by finding the sum of scores across the six items. The NCS-6 in the present sample had a Cronbach's alpha of .74.

The Five-Dimensional Curiosity Scale (5DC; Kashdan et al., 2018) measured the multidimensional construct of curiosity as well as concepts that are related to curiosity, such as openness to experience. This scale consisted of 25 questions and used a seven-point Likert scale from 1 (does not describe me at all) to 7 (completely describes me). The subscales of the 5DC are Joyous Exploration, Deprivation Sensitivity, Stress Tolerance, Social Curiosity, and Thrill Seeking. All of these subscales contained five items. Moreover, the Stress Tolerance subscale was entirely reverse-coded. The score of each subscale was calculated by finding the average of each dimension. For the present study, the subscales “Deprivation Sensitivity” and “Joyous Exploration” were used to assess the construct “Epistemic Curiosity.” No changes were made to the original scale in the survey of the present study. Statements used for the 5DC Deprivation Sensitivity subscale included (“Thinking about solutions to difficult conceptual problems can keep me awake at night.”, “I work relentlessly at problems that I feel must be solved.”). Some statements used for the 5DC Joyous Exploration subscale were (“I view challenging situations as an opportunity to grow and learn.”, “I find it fascinating to learn new information.”). Overall, in the sample the 5DC Cronbach's alpha for the Deprivation Sensitivity subscale was .83, while for Joyous Exploration the Cronbach's alpha was .78.

The Academic Motivation Scale (AMS; Vallerand et al., 1992) was used to measure the motivation of students towards learning. The questionnaire consists of 28 items, and it makes use of a seven-point Likert scale ranging from 1 (does not correspond at all) to 7 (corresponds exactly). Additionally, this questionnaire consisted of seven subscales of motivation, which had four items each: Amotivation, Intrinsic Motivation to Know, Intrinsic Motivation toward Accomplishment, Intrinsic Motivation to Experience Stimulation,

Extrinsic Motivation Identified, Extrinsic Motivation Introjected and Extrinsic Motivation External Regulation. For the present study, the intrinsic motivation subscale “Intrinsic Motivation to Know” was used to investigate academic intrinsic motivation. The scale has been adapted to use the term “college/university” as opposed to “school” which was used in the original scale. Participants needed to answer to what extent the statement corresponds to the reason they went to college/university. The scores of this survey were calculated by finding the average of each subscale.

Some examples of statements for the Intrinsic Motivation to Know subscale include: "Because I experience pleasure and satisfaction while learning new things." and "Because my studies allow me to continue to learn about many things that interest me." For Intrinsic Motivation toward Accomplishment, some of the questions are as follows: “For the pleasure that I experience while surpassing myself in my studies.” and “Because high school allows me to experience personal satisfaction in my quest for excellence in my studies.” Some examples of Intrinsic Motivation to Experience Stimulation were: “For the pleasure that I experience when I am taken by discussions with interesting teachers.” and “Because for me, college is fun.” The Cronbach’s Alpha of the Intrinsic Motivation to Know subscale is .84.

Procedure

Participants were asked to complete a survey, which took approximately 20 minutes. Each participant was provided with informed consent before the start of the study. The informed consent informed the participants about the incentives they would receive after completing the survey. In addition, the participants were well informed about their anonymous and confidential data. Participants took the survey online (made using Qualtrics) through the barcode provided in the flyers. At the same time, first-year psychology students could access this study in SONA through a link provided to them. Furthermore, the participants were also asked to fill in their student numbers to have access to their academic

grades. The study was only conducted after receiving approval from the ethical committee regarding the whole study.

The survey created uses seven questionnaires that cover academic motivation and underlying factors that can contribute to hyperfocus and flow states. The questionnaires present in the survey include the Hyperfocus in School Scale of the AHQ (Hupfeld et al., 2019), the Dispositional Flow Scale (Jackson et al., 2008), the Need for Cognition-6 scale (Coelho et al., 2020), the Utrecht Work Engagement Scale (Seppälä et al., 2009), the Five-Dimensional Curiosity Scale (Kashdan et al., 2018), the Academic Motivation Scale (Vallerand et al., 1992) and the Adult ADHD Self Report Scale v1.1 (Kessler et al., 2005). For the present study, we focus on the Hyperfocus in the School Scale of the AHQ, the Need for Cognition scale, the 5- Dimensional Curiosity Scale, and the Academic Motivation Scale.

The survey consists of several blocks to collect demographic information, education information, Five-Dimensional Curiosity scale, Need for Cognition, Academic Motivation, Utrecht Work Engagement, School Hyperfocus scale of the AHQ, Dispositional Flow Scale Short, Adult ADHD Self Report Scale and medical and personal information, and the measures of the predictor variables and the outcome measures. Two main randomizations occur in the 14 questionnaires; the first randomization will alternate the order in which the predictor variable measures are introduced to participants with the Scales for Need for Cognition, Academic Motivation, and the Five-Dimensional Curiosity Scale. The second randomization occurs for the outcome measures; participants will be presented with the Utrecht Work-Engagement Scale, the Hyperfocus in School Scale of the AHQ, and the Dispositional Flow Scale. It was done to avoid all the participants having the same sequence of questions and reduce biases.

Design

This study used two types of research designs. To test our first hypothesis, we used a correlational cross-sectional design to investigate if the three motivational factors, together and separately, had a significant effect on the frequency of experiencing a hyperfocus state. To test our second hypothesis, we implemented a correlational design to investigate if the three individual motivational factors had significant correlations with each other. This quantitative study served to explore the proposed association of the three motivational independent variables (IV) with the dependent variable (DV) regarding the frequency of experiencing a state of hyperfocus.

Our independent variables (IV) consisted of the three cognitive traits (need for cognition, epistemic curiosity, and intrinsic motivation), all using their respective questionnaires. For the sake of analysis, epistemic curiosity was divided into two separate variables: Joyous Exploration and Deprivation Sensitivity. The dependent variable (DV), school hyperfocus, was collected in the same way as the IVs, namely with its respective questionnaire. Techniques for data analysis consisted of Pearson's coefficient, multiple regression analysis, partial correlations, and ANOVA outputs.

Results

Descriptive statistics

Once the participants filled out the survey, their data was collected to check for our results' validity and reliability. In order to know the mean and standard deviation of the variables computed from the data, descriptive statistics were conducted. The hyperfocus scale has a mean of 3.11(SD=0.84). The Need for cognition scale has a mean of 3.57(SD=0.63). The two-curiosity scale, the Joyous exploration scale, has a mean of 5.12(SD=0.89), and the deprivation sensitivity scale has a mean of 4.35(SD=1.24). Furthermore, the intrinsic motivation scale, the IM to Know, has a mean of 5.65(SD=0.87).

The primary analysis used the Pearson correlation and the multiple regression analysis. In order to check for any violation of assumption for the person correlation, the linearity, normality, and outlier checks were done. While to check for the assumptions of multiple regression analysis, linearity, normality, homoscedasticity, and multicollinearity were checked using scatter plots and a histogram. The linearity assumption was checked using a scatter plot, which insinuates that the assumption was met. Furthermore, to check for the normality of the residuals, a histogram and a p-p plot was made, which insinuates that the normality assumption is met. Consequently, a scatter plot was also made to check for the assumption of homoscedasticity. An even spread of data, with no outliers, was observed, saying that the assumption for homoscedasticity was met. To test for the assumption of multicollinearity, variance inflation factor (VIF) values were calculated for the variables. Amongst all the variables, the highest VIF value was observed for the Joyous exploration scale (VIF = 1.939). At the same time, the lowest VIF value was observed for the deprivation sensitivity scale (VIF = 1.225). As a result, all the VIF values are less than 4, indicating this assumption is also not violated. In conclusion, all the assumptions were met.

Furthermore, a correlation analysis was conducted to test our hypothesis in greater detail. Table 1 depicts the correlation between all the cognitive motivators: Hyperfocus, Need for cognition, Joyous exploration, Deprivation sensitivity, and the IM to know. There appears to be a correlation between all the cognitive motivators, as all the correlation values are 0 and 1. Moreover, a strong correlation is observed between the Need for cognition and curiosity, Specifically, the Joyous exploration and the Need for cognition. In addition, a weak correlation is observed between hyperfocus and the Joyous exploration. A moderate correlation is observed between Deprivation sensitivity and hyperfocus. It is observed that deprivation sensitivity and intrinsic motivation frequently increased the state of hyperfocus.

Table 1*Correlations between the cognitive motivators*

	1	2	3	4	5
1. Hyperfocus	1.000	0.224	0.189	0.452	0.275
2. Need for cognition	0.224	1.000	0.629	0.383	0.422
3. Joyous exploration	0.189	0.629	1.000	0.372	0.520
4. Deprivation Sensitivity	0.452	0.383	0.372	1.000	0.297
5. Intrinsic Motivation to Know	0.275	0.422	0.520	0.297	1.000

Note. N=375 ,* p <0.01

Hypothesis testing

Our research predicted four hypotheses. First, hypothesis is that there is an association between all the cognitive motivators in the study. To test this hypothesis, a correlation between all the variables was calculated (Partial correlation, Semi-partial correlation, Pearson's correlation, and Squared-semi-partial correlation). A strong correlation was observed between the Need for cognition and Joyous exploration (R = 0.629, p < 0.05). A weak positive correlation was observed between the Joyous exploration and hyperfocus (R = 0.189, p < 0.05). A moderate correlation was observed between the Deprivation sensitivity and Joyous exploration (R = 0.372, p < 0.05). In addition, the partial correlation delineates

that intrinsic motivation and deprivation sensitivity increase hyperfocus in school. All the correlations observed were positive and significant. Therefore, the results help us support our hypothesis 1, that there is an association between all the cognitive motivators.

Second, it was predicted that individuals with high joyous exploration would experience a higher frequency of hyperfocus, and those with high deprivation sensitivity would experience a high frequency. The epistemic curiosity was measured using the Joyous exploration scale and the Deprivation sensitivity scale as they are highly associated with epistemic curiosity. The coefficient observed for the Joyous exploration was negative at -0.081 ($p = 0.179$). At the same time, the coefficient observed for the deprivation sensitivity was positive at 0.281 ($p = 0.001$). As a result, the hypothesis that the individuals with high joyous exploration will experience a higher frequency of hyperfocus was not supported as the results were non-significant. At the same time, the hypothesis that individuals with high deprivation sensitivity will experience a higher frequency of hyperfocus was supported by significant results.

The third hypothesis was that individuals with high intrinsic motivation would have a higher frequency of hyperfocus. This hypothesis was supported by significant results. Table 2 shows the values of the multiple regression analysis. The table helps us understand if the data is reliable and significant. It depicts that the hyperfocus scale will increase by 0.172 when there is a one-point increase in the IM to know the scale. It is observed that the values of joyous exploration and the Need for cognition are non-significant as the value is >0.05 . However, the value of the deprivation sensitivity and the IM to know the scale is significant as it is less than 0.05. Consequently, the last for the last hypothesis was predicted that individuals with a high Need for cognition would have a higher frequency of hyperfocus. However, since it is observed that the Need for cognition has a non-significant value ($p = 0.472$), the hypothesis is not supported.

Moreover, to check the significance of the regression model, an ANOVA test was conducted. The test results are found to be significant $F(4,374) = 27.63$. The p-value is less than 0.001, indicating the test's significance. Consequently, the significant results obtained help us support our hypothesis. In addition, the model explains 22.2% of the variance ($R^2 = 0.230$, Adjusted $R^2 = 0.222$, $p = 0.0001$).

Table 2

Multiple regression analysis

	Unstandardized coefficients				
	B	Standard error	t	Sig.	Sr ²
(Constant)	1.122	0.285	3.937	<0.001	-
Need for cognition	0.058	0.080	0.721	0.472	0.001
Joyous exploration	-0.081	0.060	-1.348	0.179	0.004
Deprivation sensitivity	0.281	0.034	8.207	<0.001	0.140
Intrinsic Motivation to Know	0.172	0.052	3.286	0.001	0.023

Note. Standardized score for all the cognitive motivators.

Discussion

The research was conducted to test how are the cognitive motivators associated with each other and to what extent the cognitive motivators: epistemic curiosity, intrinsic motivation, and the need for cognition, predict the frequency of the state of hyperfocus in

university students. It was found that all cognitive motivators are positively associated with each other. However, some portrayed a strong association with each other, while some portrayed a weak association. For instance, the need for cognition and the Joyous exploration is strongly associated with each other, while the Joyous exploration and hyperfocus are weakly associated with each other. In addition, it was also found that not all the proposed cognitive motivators predict the state of hyperfocus in studies. It was perceived that deprivation sensitivity and intrinsic motivation frequently increased the state of hyperfocus, while the joyous exploration and the need for cognition did not. The study's results helped us support three of the 4-hypothesis formulated.

Limited research has been conducted on the effect of hyperfocus and the motivational predictors of academic motivation in university students. Also, minimal research has been conducted on hyperfocus in healthy patients. Most of the research conducted about hyperfocus is in the context of participants with ADHD, Schizophrenia, and Autism (Ashinoff & Abu -Akel, 2019). However, some existing research helps us understand our topic with greater insight and support our hypothesis. A task has to be fun or interesting for a person to be hyper focused on it (Ashinoff & Abu -Akel, 2019). Furthermore, it has been observed that an intense flow experience was linked to higher grades and vice versa (Schüler, 2007). This same observation was understood through our research as well.

Moreover, with our research, it was found that the non -ADHD participants also experience the state of hyperfocus which fits well with the findings of Langmaid (2022), who support the experience of hyperfocus in non-ADHD patients. In addition, our study insinuates that the state of hyperfocus is experienced frequently, even in non-ADHD patients, which is corroborated by the findings of Groen et al. (2020). The study also helped us understand that the cognitive motivators can also increase the frequency of hyperfocus. It was found that deprivation sensitivity leads to an increased state of hyperfocus which fits well with the

research by Schutte et al. (2020), who suggested that higher curiosity leads to an increased state of flow. It was also found that the cognitive motivator, intrinsic motivation, also increases the frequency of the state of hyperfocus. Swan, 2021 support this.

Furthermore, the association between all the cognitive motivators was also found: epistemic curiosity, need for cognition, and intrinsic motivation. For instance, When an individual is left with an incomplete information, they deal with an aversive feeling, which can only be ended once the complete information is known (Shin & Kim, 2019). The curiosity built also makes me feel intrinsically motivated to perform the task. This depicts an association between epistemic curiosity and intrinsic motivation.

Moreover, Coelho et al. (2022) describe the need for cognition as the tendency of people to think for and engage in the task by themselves. This insinuates and supports our study that the act of engaging in a task by themselves is driven by hyperfocus. In addition, our hypothesis that there is an association between all the cognitive motivators is in line with the findings by Cacioppo et al. (1984), who found that people with a higher need for cognition and intrinsic motivation can lead to a state of hyperfocus when a task asks for mental effort or is of their interest. Consequently, this research helped us understand the effect of hyperfocus in correlation with epistemic curiosity, the need for cognition, and intrinsic motivation. In addition, it also helped us understand how each of the cognitive motivators is associated with each other.

Strengths, limitations, and future directions

Strengths

The research included a heterogenous sample of participants who were from different countries and of different ages, which helped us obtain different perspectives towards hyperfocus and by which factor or cognitive motivator they reached the state of hyperfocus. The heterogeneous sample makes the findings of the study generalizable. In addition, to

ensure that the study was conducted ethically, the participants were given informed consent at the start of the survey. Moreover, to ensure that the participants were attentive while taking the survey, three bogus questions were included. It helped us know if the participants responded to the survey truthfully.

Limitations

Firstly, the study involved many participants in the research (N = 375). The participants were recruited through Convenience sampling. As a result, there were a huge number of first-year psychology SONA participants who took part in the survey. There were a greater number of female participants than male participants. This makes the generalization the results of the study limited, as only first-year psychology students took part in the survey. However, there could be possible biases when the participants were taking the survey. Since it was an online survey, it could be that the participants already had some prior information about the survey, which they could have read online or must have heard from someone who already took the survey. Moreover, there was an incentive of 1.5 euros given out to all the participants who would take the survey. The incentive could be a reason for some participants to take part in the survey and, as a result, not fill out the questionnaire with complete attention. It could affect their motivation to take part in the study. This could lead to inaccurate results.

Future directions

The study should be replicated in the future to avoid biased responses and results obtained from this study. In order to do so, the participants should be interviewed rather than asked to fill out a survey. Semi-structured interviews should be conducted to explore all the questions in greater detail and clarity. This would also increase the validity and reliability of the results. Making use of semi-structured interviews would also reduce biases since the participants do not have much time to think before answering the questions.

In addition, the study should also be replicated considering the effect of hyperfocus and motivation predictors of academic motivation in students of all age groups and not only in university students. Since this study only focused on university students, it cannot be generalized to students of all age groups, that is, school or high school students. However, it is more likely that children must also be experiencing a state of hyperfocus predicted by different factors when going to school, which should be interesting to know. There is a possibility that children in different age groups experience the state of hyperfocus through different cognitive motivators. Therefore, to understand the effect of hyperfocus on students of different age groups, a later study should be conducted.

Conclusion

Hyperfocus, which is often spoken about in the context of ADHD patients, is also experienced by non-ADHD patients on a frequent basis. There are different cognitive motivators that predict the state of hyperfocus. The study helped us understand that the deprivation sensitivity and the IM to Know scale have significant results, while the Joyous deprivation and the need for cognition have non-significant results. It is reported that deprivation sensitivity and intrinsic motivation increase the frequency of the state of hyperfocus in students, while joyous deprivation and the need for cognition do not. Furthermore, the study also helps us understand and report the association between all the cognitive motivators present in the study. Consequently, the study helps us understand the effect of hyperfocus and motivational predictors of academic motivation in university students.

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