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ANXIETY CAN REDUCE ATTENTION AND ACCELERATE THE SUBJECTIVE PASSAGE OF TIME

This study is a test of the hypothesis that accelerated subjective time passage (ASTP) occurs as a result of increasing levels of anxiety, and, at the same time, decreasing levels of attention. The hypothesis was based on the Attentional Gate Model (AGM) and considered on an autobiographical time perception scale. The identification of underlying relationships allows to predict ASTP alteration through related elements. Among this elements are anxiety and attention. Previous studies have already helped to establish interactions between anxiety and time perception at short intervals. In this study, these interactions were determined on an autobiographical scale.

The aim of the study was to determine if there is a relationship between anxiety and time perception, which speeds up the passage of subjective time on an autobiographical scale, through a decrease in mindfulness and awareness. Methods and sample: As instruments of research were used: the author's questionnaire, the main questions of which were «Three questions about time». This questionnaire was used in 2021, in order to form preliminary conclusions. In 2023, only the «Three questions about time» were used from this questionnaire in order to establish the differences in indicators of the perception of time, taking into account the occurrence of historical events.

The STQ (Subjective Time Questionnaire) was used as a validated questionnaire to examine retrospective time perception for detailed analysis. A block of questions about the future, developed by the authors, was added to it, aimed at evaluating future time. Thus, the results of the STQ covered the entire temporal perspective.

The MAAS (Mindfulness Attention Awareness Scale) was used to study the level of attention and awareness. The STAI (State-Trait Anxiety Inventory) was used to study anxiety. The questionnaires were posted on Google Forms in 2021 and 2023. There were 74 participants in 2021 and 130 participants in 2023. To analyze the results we used: frequency, correlation analysis, and multiple regression method.

There was a significant increase in the ASTP according to the results of "Three", probably caused by the war in Ukraine and the growth of anxiety in society. Both trait and state anxiety showed significant correlations with the perception of time by STQ and «Three» blocks. The strongest correlations were found on the factor "trait anxiety" with STQ blocks "time pressure" [r=0.321; p<0.001] and "time expansion" [r=0.333; p<0.001], a weaker relationship was found with the "speed time" block [r=0.177; p=0.044]. Negative associations were identified between the Mindfulness and Awareness index (MAAS) and state anxiety (r=-393; p<0.001) and trait anxiety (r=-442; p<0.001). MAAS was associated with STQ: negative correlations of MAAS were identified with blocks of STQ "time pressure" [r=-0.375; p<0.001], "time expansion" [r=-0.207; p=0.019] and "speed time" [r=-0.182; p=0.040] That is, a vicious circle was formed: Anxiety-Attention-ASTP-Anxiety.

Keywords: *time perception, accelerated subjective time passage, time perspective, attention, consciousness, anxiety.*

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ТРИВОГА ЯК ФАКТОР ЗМЕНШЕННЯ УВАГИ ТА ПРИСКОРЕННЯ СУБ'ЄКТИВНОГО ПЛИНУ ЧАСУ

Це дослідження є тестом гіпотези про те, що прискорений суб'єктивний часовий прохід (ASTP) відбувається внаслідок підвищення рівня тривоги і, в той же час, зниження рівня уваги. Гіпотеза ґрунтувалася на моделі уважних воріт (AGM) і розглядалася на автобіографічній шкалі сприйняття часу. Ідентифікація основних відносин дозволяє передбачити зміну ASTP через відповідні елементи. Серед цих елементів - тривога та увага. Попередні дослідження вже допомогли встановити взаємодію між тривожністю та сприйняттям часу через короткі проміжки часу. У цьому дослідженні ці взаємодії визначалися в автобіографічному масштабі.

Метою дослідження було визначити, чи існує взаємозв'язок між тривожністю та сприйняттям часу, яке прискорює проходження суб'єктивного часу в автобіографічному масштабі, через зменшення уваги та усвідомлення. В дослідженні була використана аторська анкети, основними питаннями якої були питання про час. Ця анкета була використана в 2021 році, щоб сформувати попередні висновки. У 2023 році з цієї анкети були використані лише три питання про час, щоб встановити відмінності в показниках сприйняття часу, враховуючи виникнення історичних подій.

Ключові слова*: сприйняття часУ, прискорений суб'єктивний уривок часу, перспектива часу, увага, свідомість, тривога.*

It is now generally accepted that, for most people, the passage of subjective time speeds up with age (Coelho et al., 2004; Craik & Hay, 1999; Halberg et al., 2008; Kosak et al., 2019; Winkler et al., 2017; Wittmann & Lehnhoff, 2005). The widespread prevalence of this experience has been shown in studies by scientists from different countries. For example, in 2007 Friedman, W. J. & Janssen, S. M. studied 78.7% participants from the Netherlands that indicated time passage as "fast" or "very fast" (Friedman & Janssen, 2010). Also, 64.4% of the interviewed residents of Eastern Europe (mainly Ukraine) in the study in 2021 noted in themselves the accelerated subjective time passage (ASTP) (Tsybulsky, 2023b, 2023a). Various questions interest researchers of psychology of time. Some try to define the causes of this phenomenon (Bejan, 2019; Hulett, 1944; Kent & Wittmann, 2021; Matthews & Meck, 2014; Meck, 1996), others try to figure out the conditions associated with it. Rest others try to find out emerging consequences. The practical value of all research, however, is the ability to manage perceptions of time. Although in some situations people would like to speed up time, but on an autobiographical scale, ASTP evokes worries. That is, it is an adverse experience. The dependence of emotions and time perception has been confirmed in studies Droit-Volet, S. et al.

(Angrilu et al., 1997; Droit-Volet, 2013; Droit-Volet & Gil, 2009; Droit-Volet & Meck, 2007; Gilliland et al., n.d.; Tipples et al., 2015). However, not only emotions or personality traits affect the perception of time. A link has been found with many other factors, such as: age, gender, having children (Wittmann & Mella, 2021), intelligence, motor activity (Tsybulsky, 2022), etc. The involvement of time perception in other mental processes has been determined at the level of brain wave activity (Bueti & Walsh, 2009; Klimesch, 2012; Rogachev & Sysoeva, n.d.; Bushov et al., 2007; Tumialis, n.d.). Thus, the perception of time seems to be closely related to consciousness and to its main property, attention. From this point of view, the underlying factors interacting with ASTP can be studied through decreasing or increasing attention and its derivatives at other scales of measurement: daily, weekly, monthly, annual, autobiographical and, even, historical. At the same time, it can be assumed that not only ASTP is capable of causing anxiety or worry, but also that anxiety is capable of causing ASTP. This assumption is reasonable, because at short intervals the relationship between the two has already been deremined (Bar-Haim et al., 2010; Sarigiannidis et al., 2020; Tonev et al., 2019; Whyman & Moos, 1967; Zakay & Block, 1995). This study hypothesized a relationship between trait anxiety and ASTP on an autobiographical scale, through decreased attention and mindfulness.

Despite the involvement of the perception of time in both conscious and unconscious mental processes, it is the estimation and experience of time is associated exclusively with consciousness. Only in the conscious state are we capable of constructing a temporal perspective, estimating long periods of time (more than 2-3 seconds), predicting, or planning events. Representation of Total Time (RTT) allows us to carry out these processes, at the same time increasing the efficiency of activities during and beyond life.

In Tsybulsky A. study it was suggested that chronic exposure to consciousness of factors that cause a decrease its quality (clarity, responsiveness, motivation, vigor, etc.) may be accompanied by acceleration of subjective time (Tsybulsky, 2023b). This assumption was indirectly confirmed by the correlation among those who noted laziness, weakness, lack of desire to develop and muted consciousness, and those who noted ASTP ($r=0.266$; $p=0.022$). Further investigation led to a link between the phenomenon under study and anxiety. A total 68.9% of participants answered the question, "Do you have unreasonable anxiety, worry, or fear?" in the affirmative. In this regard, the literature data were examined.

Associations between anxiety and time perception at short intervals have been earlier determined (Bar-Haim et al., 2010; Sarigiannidis et al., 2020). State anxiety can speed up the passage of subjective time at approximately one-minute intervals. The relationship determined in this study suggested that trait anxiety, which is a more permanent, is also capable of speeding up the passage of subjective time on an autobiographical scale.

When we talk about the experience of time, we consider two global directions of time perception: retrospective and prospective. Obviously, both are interdependent, despite the shift in focus from the present to the past or to the future, respectively. A high level of trait anxiety is a stable state of expectation of negative events in the future, shaped by negative events in the past. Thus, the attention of people with anxious personality traits is "scattered" in the present. This is consistent with scientific findings of deficits of attention-related cognitive functions in state of high anxiety (Bar-Haim et al., 2010; Eysenck, 2013) and with Attentional Control Theory (Eysenck et al., 2007). Given that the individual is able to predict and control future outcomes of the activity namely in present, it is not surprising that temporal decentration leads to such negative effects of time perception as "pressure", "expansion", and "loss of control."

The hypothesis is consistent with the AGM (Attentional Gate Model) of time perception, which explains accounting for time through the attentional allocation between attention to time and to other objects (Zakay & Block, 1995). It aims to a prospective assessment of time, but may be a link between retrospective time perception, which is based more on memory, and prospective time perception, which relies heavily on attention and the prediction of possible outcomes of what is happening (Zakay, 1993). This conclusion is based on the correlations between estimated past and future life

spans [Past-Present r=0.541; p<0.001; Past-Future r=0.482; p<0.001; Present-Future r=0.563; p<0.001] obtained in this study. The underlying of representation of total time AGM mechanism explains the relationships between perceptions of time and psychological states at different scales of subjective time, as well as the phenomena arising therefrom.

This model describes the estimation and measuring of time spans by means of pass of frequency impulses through several blocks, the main ones are the pacemaker and the attentional gate. Passing them, the stimuli through a switch enter to the cognitive counter (see Fig. 1).

Accordingly, there are two factors that can affect these units: 1. Arousal - can increase the number of pulses coming from the pacemaker, and 2. Attention to time - switches the attention gate to time pulses or to other objects, blocking their passage to the switch (Bar-Haim et al., 2010; Zakay & Block, 1995). When arousal is dominant, attention automatically switches to time (e.g., to speed of moving of a threatening object in space, causing time estimation).

This leads to an overestimate of time (i.e., its subjective slowing down). It is considered that arousal cannot be long, intervals up to 2-3 seconds are estimated, after which adaptation occurs and arousal decreases. Longer intervals are estimated and measured already with attention directed to external markers of time (including sociogenic).

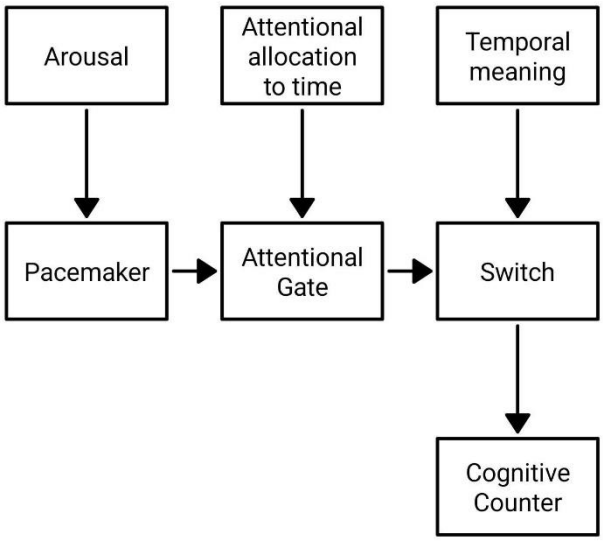

Figure 1: Simplified scheme of the AGM

When anxiety is elevated, attention resources are directed toward potentially threatening goals to the detriment of attention to time, resulting in underestimation of time intervals (i.e., acceleration of subjective time) (Bar-Haim et al., 2010). In this case, we can speak of a decrease in attention to time, which causes the ASTP effect.

Citizens of Ukraine were invited to participate in the study via social networks. The survey was conducted twice: in 2021, 74 people participated in it. In 2023 the number of participants was 130 people. Predominantly women (in 2021 - 89.2% of women, 2023-94.6%). The age of respondents in 2021 ranged from 17 to 62 years old, and in 2023 from 17 to 69 years old. Secondary education (high school) had 16.9% (N 22), specialized secondary education (college) 31.5% (N 41), higher education (bachelor or master) 47.7% (N 62), scientific degree 3.8% (N 5). Marital status: single - 24.4% (N 33), married - 50.8% (N 66), divorced - 23.8% (N 31). Having of children: without children - 25.4% (N 33), with children - 74.6 (N 97).

The first questionnaire was developed by the author independently. It included 41 questions, the purpose of which was to preliminarily determine correlations between the perception of time and other elements of mental activity. Thanks to this questionnaire, ideas for a further study of the ASTP were formed. Among all the questions, the main ones aimed at determining the presence and

prevalence of the ASTP phenomenon were asked. They were conventionally called the "Three" questions about time:

1. "Do you notice the change of time passage?" with variants of answers: 1. It seems Time has slowed down, 2. It seems Time has sped up, 3. Didn't notice anything like that.
2. "Do the years fly too fast by?" with answer choices: 1. Disagree, 2. Agree, 3. Didn't think about it.
3. "How do you feel the Time?" with options: 1. It stretches too slowly, 2. It flies too fast, 3. It goes on its own.

The first time these questions were asked in the author's questionnaire in 2021. The second time from the author's questionnaire, the "Three" was asked in the 2023 study. Other instruments were also used with it.

The STQ (Subjective Time Questionnaire) was used to obtain detailed and reliable information about the speed of the subjective time passage. In the original it consists of several blocks of questions aimed at determining the speed of the passage of subjective time: the present and the past. In this study, an additional block of questions was added to the questionnaire aimed at determining the participants' attitudes toward future time.

The number of questions in the past and future blocks for each participant varied with their age. Responses were analyzed either by mean score or summarized into three groups of "Slow," "Moderate," and "Fast" passage of subjective time. The final score for all questions in the block was assigned to one of the three prevalence response groups.

In addition, the STQ includes blocks of statements whose degree of agreement determines qualitative characteristics of time perception, such as: pressure, expansion, and control of time. The Mindfulness Attention Awareness Scale (MAAS) of K.W. Brown, R.M Ryan, as most reflective of the concept of "quality (clarity) of mind" in everyday life (Brown & Ryan, 2003).

The state-trait anxiety inventory (STAI) of C.D. Spielberger was used to determine levels of state (STAI-S) and trait (STAI-T) anxiety (Spielberger et al., 1970). All instruments were translated into Ukrainian and adapted for better understanding.

The invitation to participate in the study was published on social networks. In 2021 the survey in Google Forms was open for 7 months. In 2023 the survey was created on 03.03.2023, acceptance of answers was stopped on 30.03.2023. Ukrainians, mostly located on the territory of Ukraine, participated in the survey.

SPSS Statistics and Jamovi programs were used for data analysis. Descriptive statistics, frequency analysis, Pearson's r-criterion correlation analysis, and multiple regression analysis were used. Due to the unfolding historical events in the world and, above all, in Ukraine, among whose citizens the study was conducted in 2021 and 2023, it is important to pay attention to a greatly increased percentage of participants who marked the ASTP.

The frequency distribution of answers to the question "Do you notice the change of time passage?" showed 83.8% of those who answered "It seems Time has sped up" in 2023, in contrast to the study of 2021, when only 64.8% chose the same answer. Also, the answer "It seems Time has slowed down" was chosen by 7.7% in 2023 and 6.7% in 2021. The answer "Didn't notice anything like that" was 8.5% in 2023 and 28.3% in 2021.

The frequency distribution of responses to the question "Do the years fly too fast by?" showed 88.5% answering "Agree" in 2023 and 84.4% in 2021. "Disagree" - 6.9% responded in 2023 and 10.8% in 2021. "Didn't think about it" - answered 4.6% in 2023 and 6.7% in 2021.

The frequency distribution of responses to "How do you feel the Time?" showed 77.7% answering "It flies too fast" in 2023 and 45.9% in 2021. "It stretches too slowly" was answered by 5.4% in 2023 and 2.7% in 2021. "It goes on its own" was answered in 2023 by 16.9% and in 2021 by 51.3%.

Calculating the average percentage of those who noted ASTP through all of the "Three" questions showed 64.4% in 2021 and 83.0% in 2023.

To examine the specifics of the "Three" questions about time in detail, a comparative analysis with the STQ was conducted and the following results were obtained:

1. Responses to the question "Do you notice the change of time passage?" showed a significant relationship with responses to the STQ blocks: "Past" [r=0.534; p <0.001], "Future" [r=0.390; p <0.001], "Time Pressure" [r=0.426; p <0.001], and "Time Speed" [r=0.403; p <0.001].
2. Responses to the question "Do the years fly too fast by?" showed a significant relationship with responses to the STQ blocks, "Past" [r=0.586; p <0.001], as well as a trend for the "Past Youth" block [r=0.148; p=0.092], "Future" [r=0.375; p<0.001], "Time Pressure" [r=0448; p<0.001], "Time Speed" [r=0.416; p<0.001], and "Slowness" [r=-0.173; p=0.048].
3. Responses to the question "How do you feel the Time?" showed a significant relationship with responses to the STQ blocks, "Past" [r=0.496; p<0.001], "Future" [r=0.340; p <0.001], "Time Pressure" [r=0.511; p <0.001], "Time Speed" [r=0.412; p <0.001] and a negative trend for the "Slowness" block [r=-0.168; p=0.056]. In addition, the question showed significant positive correlations with STAI-T [r=0.261; p=0.003]; STAI-S [r=0.250; p=0.004] and a negative correlation with MAAS [r=-0.238; p=0.007].

The frequency distribution of the STQ results showed that, on average, 75.4% of participants in the "Past" block responded that time passed "fast" or "very fast" for them, 21.5% responded "neither slowly nor fast" and 3.1% responded "slowly" or "very slowly". In the "Present" block, 66.2% responded that time passes "fast" or "very fast", 31.5% - "neither slowly, nor fast", and 2.3% - "slowly" or "very slowly." In the "Future" block, 63.8% responded that time passes "fast" or "very fast", 24.6% responded "neither slowly nor fast", and 11.5% responded "slowly" or "very slowly."

The results of the correlation analysis showed a consistent relationship between the "Past", "Present", and "Future" blocks [Past-Present r=0.541; p <0.001; Past-Future r=0.482; p <0.001; Present-Future r=0.563; p <0.001].

Significant correlations of the subjective perception of the passage of time with the level of education of the participants were determined. It interacted negatively with the block "expansion" of time [r= -0.381; p <0.001] and less with "slowness" [r= -0.223; p=0.011]. In addition, negative correlations were found with STAI-P [r= -0.258; p=0.003].

To confirm or refute the hypothesis of a relationship between anxiety and acceleration of time on a biographical scale, participants to take a test to determine measures of state and trait anxiety were asked. According to the results of the ranging of the obtained data: 53.1% of the participants had a high level, 42.3% had a moderate level, and 4.6% had a low level of trait anxiety. Also 53.1% were classified as high, 39.2% as moderate and 7.7% as low level of state anxiety. The expected correlation was shown by the results for state and trait anxiety [r=0.726; p <0.001].

The strongest correlations were found for the "trait anxiety" factor with the STQ blocks "pressure" [r=0.321; p <0.001] and "expansion" [r=0.333; p<0.001], a weaker relationship was found with the "speed" block [r=0.177; p=0.044]. There was also a weak relationship with retrospective estimates of time passage speed [r=0.179; p=0.041]. Associations of lesser significance were determined for the factor "state anxiety" with the blocks "pressure" [r=0.278; p=0.001], "expansion" [r=0.229; p=0.009] and at the 20-29 age range [r=0.200; p=0.022].

At the same time, responses to the "Do you notice the changes of time passage?" question showed a weak relationship with the "trait anxiety" factor [r=0.182; p=0.038], and to the question "How do you feel the time?" with the "state anxiety" factor [r=0.182; p=0.038].

There was also a negative correlation [r=-0.442; p<0.001] between trait anxiety and mindfulness according to the results of the correlation analysis. The relationship was slightly weaker between state anxiety and MAAS [r=-0.393; p <0.001].

Negative correlations of MAAS were determined with STQ "time pressure" scores [r=-0.375; p<0.001], "time expansion" [r=-0.207; p=0.019] and "time speed " [r=-0.182; p=0.040] (see Table 1).

Table 1.

Results of correlation analysis on the factor "Mindfulness and Awareness" (MAAS) with the STQ blocks and the "Three's" question

Pearson's r	STQ Past	STQ Pressure	STQ Expansion	STQ Speed	How do you feel the time?
MAAS	-0,192	-0,375	-0,207	-0,182	0,238
Sig. p	0,030	<0,001	0,019	0,040	0,007

To analyze the direct contribution of anxiety and mindfulness and awareness measures to the ASTP alteration, and of ASTP measures to the alteration of anxiety and mindfulness, a series of multiple regression models were constructed, with anxiety, mindfulness and awareness measures and time pressure as predictors.

Using a regression model, it was found that:

1. A 19.7% in acceleration of subjective time passage is explained by high levels of trait anxiety and low levels of mindfulness and awareness. A sequential calculation of the contribution of each predictor in the model suggests that anxiety is a slightly more significant predictor (14.7%) than mindfulness and awareness (13.8%) [F=15.6; p<0.001].
2. The 24.5% decrease in mindfulness and awareness is explained by high levels of anxiety and time pressure. A sequential calculation of the contribution of each predictor to the model suggests that anxiety was most significant (19.7%) and time pressure was least significant (13.8%) [F=20.6; p <0.001].
3. The high level of anxiety at 34.1% is explained by high indicators of time pressure (21.6%) and low - mindfulness and awareness (19.7%) [F=32.8; p <0.001].

It was found that the percentage of participants who noted ASTP increased significantly in March 2023, compared to the 2021 survey. These changes are likely related to ongoing events in Ukraine and the world. Obviously, the level of anxiety in Ukrainian society was lower before the outbreak of war. Unfortunately, the same tools were not used in 2021 to determine the level of anxiety among respondents as in 2023, so there is no data to compare with the current level. Nevertheless, an increase in participants experiencing ASTP through the «Three» was determined from 64.4% in 2021 to 83.0% in 2023 on average for all questions. These observations were collected at the epicenter of historical events. It is this fact that can reflect mass stress, anxiety and insecurity about the future through the perception of time.

The question «How do you feel the Time? » of the «Three» questions focuses more on the situational present. The changing of the results for this question in 2023, relative to the survey in 2021, is the highest among the other «Three» questions: the percentage of participants who answered "It flies too fast" increased from 45.9% to 77.7%. It is likely that the specificity of this question directly affects anxiety scores. This is confirmed by significant correlations on the factors «trait anxiety», «state anxiety», and «mindfulness and awareness».

Significant correlations with most of the STQ blocks confirm the validity of the "Three" questions aimed at determining the presence and prevalence of ASTP, but also point to serious limitations, namely the impossibility to quantitatively and qualitatively detail the results.

The use of "Three" questions in this study makes it possible to suggest a causal relationship: increased anxiety in society as a result of ongoing historical events causes ASTP in those who previously in other circumstances did not reflect on the passage of time, or (less frequently) perceived it as slowing down.

Much research has been devoted to the relationship of anxiety and perception of time on a situational scale. Anxiety at short time intervals (up to 2 s) has been found to contribute to slowed down perception of a threatening stimulus (Bar-Haim et al., 2010). This concept has been linked to the assumption that an adverse event causes subjective time slowing down (Fayolle et al., 2015;

Tipples, 2008, 2011). However, it has subsequently been suggested that fear and anxiety should be separated. Fear is an acute repulsive state caused by an imminent definite threat, associated with maximum concentration on the threatening object, while anxiety is a more prolonged repulsive state caused by an uncertain threat that may arise in the future. Building on these notions, Sarigiannidis I at al. (Sarigiannidis et al., 2020) was able to show that anxiety can accelerate the subjective time passage within an experiment. This study provided evidence that not only state anxiety, but also trait anxiety, is correlated with ASTP on an autobiographical scale. Not surprisingly, state and trait anxiety scores are related, but at different time intervals it is worth considering both increasing state anxiety and existing trait anxiety (Pacheco-Unguetti et al., 2010).

An analysis of the results revealed that anxiety factors are primarily related to qualitative estimates of the subjective time passage, precisely those parameters that delineate the framework of the subjective present. A stronger relationship is shown by trait anxiety with the "Time Pressure" block. Inability to organize one's time, loss of control over it, and persistent thoughts about the lack of time contribute to trait anxiety. The relation with retrospective estimates of the passage of time confirms this conclusion, because the earlier ASTP appeared, the earlier anxiety as a personality trait began to strengthen, or, conversely, the earlier the signs of anxiety appeared, the earlier ASTP began to develop.

It is known that anxiety can be the result of a variety of reasons, including genetic reasons. Even the gender of interviewees can affect time perception, as women are more prone to anxiety (Altemus et al., 2014; Jalnapurkar et al., 2018; Lewinsohn et al., 1998; McLean & Anderson, 2009). The relationship between trait anxiety and attention has been determined in studies using the Attentional Control Scale (Derryberry & Reed, 2002). Attention control theory suggests two systems of attention control: goal-directed and stimulus-driven systems (Corbetta & Shulman, 2002; Posner & Petersen, 1990). In anxious individuals, the stimulus-driven system suppresses the goal-directed system. Attention is dispersed between primary stimuli and peripheral, threatening task-irrelevant distractors. It has been found that this does not reduce performance, but slows down task performance (Eysenck et al., 2007). In addition, it has been noted that distractors can be external and internal (such as anxious thoughts or rumination). In other words, collectively, distracted attention may be a factor in causing ASTP.

These findings are consistent with the AGM and suggest a relationship between attention and time perception on an autobiographical scale. Sarigiannidis I. in his study notes that attention during heightened anxiety is diffused between an uncertain threatening object in the future (the expectation of negative outcomes from activities in the present) and what is happening in the present. Trait anxiety is a factor in the constant anticipation of an uncertain adverse event, leading to a reduction in attention to time. Constant tension is also associated with anxiety: excessive reactions to potentially threatening stimuli and expectation of negative developments. This condition leads to mental exhaustion and, possibly, to depression in the future. In turn, mental exhaustion leads to a decrease in attention resources, that is, a decrease in mindfulness and awareness.

In turn, this result makes you feel the acceleration of subjective time (STQ). Such a chain of interactions forms a circle that supports the maintenance of the pattern of interactions. However, each link in the chain can be influenced by other factors, which are displayed by changes in the others.

The results of this study suggest that a vicious circle of interactions must lead to a steady increase in anxiety, the speed of the subjective time passage, and a decrease in mindfulness and awareness (see Figure 2). This probably does happen in some cases and leads to late-life depression. The link between anxiety and depression has been established by scientific research (Balashova & Mikeladze, 2016; Sévigny et al., 2003).

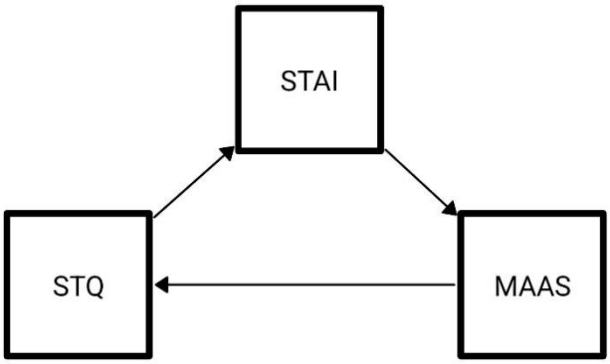

Figure 2: The underlying Correlations Chart with STQ shows that awareness of time (through loss of control of time (Speed Time) and time pressure) increases anxiety (STAI), which decreases mindfulness (MAAS)

However, this does not always happen, which means that there are restraining mechanisms. In favor of this assumption the negative relation between anxiety and the level of education [r=-0.258; p=0.003] indicates. Perhaps people who strive to develop throughout life tend to organize their subjective time more efficiently.

In addition, it was found that with age, people think less about death, they are not frightened by the irreversibility of time and the inevitability of death. It looks as if a protective mechanism of avoidance is activated in opposition to growing anxiety and ASTP.

Obviously, there are other factors included in the "circle of interactions", both strengthening and weakening its components. These may be the quality of sleep, daytime sleepiness, age-related changes in cognitive functions. Namely the notion of a structure of underlying interactions reveals the opportunity to building a theoretical foundation for further research.

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