



THE REPUBLIC OF TURKEY

ANKARA YILDIRIM BEYAZIT UNIVERSITY

THE GRADUATE SCHOOL OF SOCIAL SCIENCES

**EVALUATING WISDOM WITH SELF-REPORT AND
PERFORMANCE MEASURES AND ITS ASSOCIATIONS
WITH EXECUTIVE FUNCTIONS**

MASTER THESIS

Hüseyin Zahid CAMBAZ

DEPARTMENT OF PSYCHOLOGY

ANKARA, 2023

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Advisor

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ANKARA, 2023

APPROVAL PAGE

The thesis, prepared by Hüseyin Zahid CAMBAZ and titled “Evaluating Wisdom with Self-Report and Performance Measures and Its Associations with Executive Functions” is accepted by a unanimous vote as a master thesis at Ankara Yıldırım Beyazıt University, Institute of Social Sciences, Department of Psychology.

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DECLARATION

I declare that this thesis is my own work, that I have not had any unethical behavior infringing patent rights and copyright at any stages from the planning to writing of the thesis, that I have obtained all the information in this thesis within academic and ethical rules, and that I have cited all the information and comments used in this thesis. 15-06-2023

Signature

Hüseyin Zahid CAMBAZ



DEDICATION



To the wisest teachers

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Every ending opens a road to new beginnings in life. I have come to the end of my master's education journey, which holds immense potential for shaping my future. Prior to starting my bachelor's education in psychology, I could never have imagined that this field would become so deeply integrated within myself. So, contrary to the perception of time as a one-directional line, perhaps the immense potential in the future influenced my past to choose this valuable area. Therefore, I would like to express my gratitude to my advisor, Asst. Prof. Dr. Gülten ÜNAL, who has been guiding me since my bachelor's degree education. She has made significant contributions to both me and my academic journey from the very beginning.

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ABSTRACT

Evaluating Wisdom with Self-Report and Performance Measures and Its Associations with Executive Functions

The aim of this study is to examine the concept of wisdom in Turkish culture from a psychological perspective, as well as its relationship with executive function (EF). To achieve this aim, different measurement methods were used to assess wisdom, including performance measures (BWP, Berlin Wisdom Paradigm and GWR, Grossmann Wise Reasoning) and self-report measure (SAWS, Self-Assessed Wisdom Scale). Inhibition (the go/no-go task) and task-switching paradigms were used to measure EF. One-hundred-forty-nine university students participated. According to the mean scores, the participants reported a higher level of wisdom in the SAWS, while they performed at an average level for the BWP. Lower performance was observed for the GWR. There was a tendency for the SAWS to be negatively correlated with the GWR. Besides, according to correlational analyzes, both the BWP and the GWR demonstrate a positive trend in their relationship. The SAWS, appears to be unrelated to the BWP. Inhibition performance in the second go/no-go task (the first one is unrelated) is positively correlated with the total score of the GWR. Uncertainty sub-dimension of BWP is positively correlated with task-switching. There is no other correlation between EF (inhibition, task-switching) and the total score of wisdom measurements (the BWP, the GWR, and the SAWS). According to SEM results which has a good of fit, there is a .43 correlation between higher-order EF and higher-order wisdom variables which is insignificant according to covariance analyzes. Besides, the findings indicate a paradox where individuals who self-report as wise get low scores in performance measures. Also, regression model which has good of fitness and %49 explainability, no single variable significantly explains wisdom, which confirms the complex nature of

wisdom. Findings suggest that the recognition of many ways situation may unfold sub-dimension of the GWR may be significantly related to EF usage.

Keywords: wisdom, executive functions, inhibition, task-switching, performance and self-report measurement



ÖZ

Bilgeliğin Öz-Bildirim ve Performans Ölçümleri ile Değerlendirilmesi ve Yürütücü İşlevlerle İlişkisi

Bu çalışmanın amacı, Türk kültüründe bilgelik kavramını psikolojik bir perspektiften ve yürütücü işlevler (İng. executive functions; EF) ile ilişkisini incelemektir. Bu amaçla bilgelik için performans ölçümleri (BWP, Berlin Bilgelik Modeli ve GWR, Grossmann'ın Bilgece Muhakemesi) ve öz-bildirim ölçeği (SAWS, Kendine Yönelik Bilgelik Algısı Ölçeği) kullanılmıştır. EF için ise baskılama (yap/yapma görevi) ve görev-değiştirme paradigmaları kullanılmıştır. Çalışmaya 149 üniversite öğrencisi katılmıştır. Çalışmanın sonuçlarına göre, yaş ile bilgelik ölçümleri arasında ilişki yoktur. BWP'de kadınlar erkeklerden daha iyi performans göstermiştir. SAWS'ın deneyim boyutunda erkek katılımcılar kadınlara göre daha yüksek puan bildirmiştir. Gelir algısı, BWP'nin belirsizliği tanıma boyutu ile pozitif korelasyona sahiptir. Anne eğitim durumunun ve yaşanılan yerin bilgeliğin bazı boyutları açısından farklılık oluşturduğu bulgulanmıştır. Ortalama puanlara göre, katılımcılar SAWS'ta yüksek düzeyde bilgelik raporlamışlardır, BWP için ortalama bir performans sergilemişlerdir ve en düşük performansı GWR'de göstermişlerdir. Ayrıca, SAWS'ın GWR ile negatif korelasyon eğiliminde olduğu gözlemlenmiştir. Ayrıca hem BWP hem de GWR arasında -alt boyutlar açısından- pozitif korelasyon eğilimi gözlenmiştir. SAWS ve BWP ise ilişkili değildir. BWP'nin belirsizliği tanıma alt boyutu görev değiştirme ile pozitif korelasyon gösterirken, inhibisyon performansı ikinci yap/yapma görevinde GWR toplam puanı ile pozitif korelasyon göstermektedir. Diğer EF (inhibisyon, görev-değiştirme) ile bilgelik ölçümlerinin (BWP, GWR ve SAWS) toplam puanları arasında herhangi bir korelasyon gözlenmemiştir. İyi uyum değerlerine sahip Yapısal Eşitlik Modellemesi (YEM) sonuçlarına göre, üst-düzey EF ve üst-düzey bilgelik değişkenleri arasında .43 korelasyon

gözlenmiştir ancak kovaryans analizine göre bu korelasyon anlamlı değildir. Üst-düzey bilgelik değişkeni, GWR (.76) ve BWP (.23) ile pozitif yükleme göstermektedir ancak SAWS (-.37) ile negatif bir ilişki göstermektedir. Dolayısıyla, kendilerini bilge olarak değerlendiren bireylerin performans ölçümlerinde düşük puanlar aldığı bir paradoks gözlemlenmiştir. Ayrıca, YEM regresyon sonuçlarına göre bir değişkenin bilgelik kavramını tek başına açıklamakta yetersiz kalması bilgelik kavramının karmaşık doğasını doğrulamaktadır. Bulgular, GWR'nin durumun farklı şekillerde gelişebileceğinin ve değişimin tanınması boyutunun EF kullanımıyla önemli bir şekilde ilişkili olabileceğini göstermektedir.

Anahtar Kelimeler: bilgelik, yürütücü işlevler, baskılama, görev-değiştirme, performans ve öz-bildirim ölçümü

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ABBREVIATIONS

ANOVA	: Analysis of Variances
B1-2-3:	: Block 1-2-3
BWP	: Berlin Wisdom Paradigm
EF	: Executive Functions
FMRI	: Functional Magnetic Resonance Imaging
GWR	: Grossmann's Wise Reasoning
RQ	: Research Question
SAWS	: Self-Assessed Wisdom Scale
SEM	: Structural Equation Modelling
SPSS	: Statistical Package for the Social Sciences

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1. INTRODUCTION

The concept of wisdom is central to different areas such as history, philosophy, and religion (Assmann, 2019; Gordis, 1981; Sloterdijk, 2012). Examining wisdom from a psychological perspective is new in comparison to other areas (Bower, 1990; Sternberg, 2005). Research in wisdom from a psychological perspective examines how the concept of wisdom affects daily life and how it facilitates the life of individuals using psychological methodologies. Thus, understanding the psychological mechanisms included in the concept of wisdom is expected to play an important role in understanding and developing wisdom. There are a few studies of wisdom in Turkish culture (Cambaz & Ünal, 2023; Ünal, 2021), in comparison to global literature (Grossmann et al., 2010; Grossmann et al., 2020; Sternberg, 1998; Sternberg & Jordan, 2005). More studies from a psychological perspective are needed in Turkish culture to understand wisdom in Turkey.

The primary objective of the study is to investigate the relationship between wisdom and executive function (EF), specifically task-switching and inhibition. Previous research has shown the importance of inhibition and task-switching abilities from a self-regulatory perspective and in social contexts (Hofmann et al., 2012; Thomsen et al., 2018). However, there is limited research that has used computer-based tasks of executive function and wisdom measurements together (Dumbravă, 2017). There are two types of measurements for wisdom, self-report, and performance, but studies on wisdom typically and only use one type of measurement. The use of different types of measurements is crucial for understanding the concept of wisdom (Cambaz & Ünal, 2023; Glück et al., 2013). Moreover,

dominant performance measurement paradigms for wisdom, such as the Berlin Wisdom Paradigm (Baltes & Smith, 1990) and Grossmann's Wise Reasoning, are almost non-existent in Turkish culture. In conclusion, the study aims to achieve several objectives: firstly, to investigate the relationship between wisdom and EF; secondly, to explore the relationship between different types of wisdom measurements, both self-reported and performance-based; and thirdly, to assess how wisdom measurements vary based on demographic variables.

To start, the concept of wisdom was explained from a psychological perspective, followed by a summary of the executive functions used in this study. Then, the literature was reviewed to explore how wisdom and executive functions may be related. Next, analyses that examine and detail the relevant research questions from various perspectives were conducted. The results of these analyses are presented in the results section, and the implications of these results are discussed in the context of the literature.

1.1. Wisdom from Psychological Perspective

There are difficulties in defining wisdom arising from the necessity of the definition itself and the nature of the wisdom concept. Compromising on the meaning of a concept is hard, and while making a definition, some part of the concept's nature may not be covered (Walsh, 2015). In addition to these general difficulties, the definition difficulties specific to wisdom include the existence of subtypes of wisdom that operate in different ways (Walsh, 2011). Furthermore, the fact that wisdom is a concept that requires a deep understanding and a developmental perspective to be understood (Kramer, 2003) makes it much more comprehensive. Wisdom is seen as one of the most complex traits of culture and individuals (Birren, & Svensson, 2005, p. 28).

Despite the difficulties in defining wisdom, there are different attempts examining common aspects of wisdom (Bluck & Glück, 2005; Grossmann et al., 2020; Sternberg, 2004). For instance, many researchers in the field of wisdom came together to identify the common aspects of the wisdom concept and established a team called the "Wisdom Task Force" (Grossmann et al., 2020). This team presented a shared wisdom model. In this model, wisdom is evaluated through three basic sources, including (i) metacognition, (ii) context, culture, experiences, and (iii) moral aspirations. Accordingly, wisdom is a concept that has very different features in its nature such as prosocial behavior, self-transcendence, metacognitive abilities, general trait, and self-control (Grossmann et al., 2020).

In addition, a study examining different wisdom theories and the common aspects of these theories also revealed some common elements regarding this concept (Bluck & Glück, 2005). According to this study, (i) cognitive foundations of wisdom include crystallized intelligence, (ii) wisdom refers to an insightful ability that includes motivation to grasp and solve a problem, (iii) in wisdom, there is the motivation to reflect on things, and this motivation is important for learning through experience (this is called the reflective attitude), and (iv) wisdom requires concern for others, and it requires being able to look at relevant events from the perspective of others, be empathetic, and be courteous.

Studies about wisdom generally regard two types in operational definition, which are personal and general wisdom. Personal wisdom refers to insights and considerations of a person about his/her own life. General wisdom, on the other hand, refers to an individual's general insight toward life from an observer's point of view (Mickler & Staudinger, 2008; Sternberg, 1998). Self-report measurements in wisdom are evaluations of the individual towards his/her own life in a particular way. Different attempts to measure self-reported wisdom result in different scales, such as the Three-Dimensional Wisdom Scale (3D-WS; Ardelt, 2003), Self-Transcendence Scale (ASTI; Levenson et al., 2005), San-Diego Wisdom

Scale (SD-Wise; Thomas et al., 2019), and Self-Assessed Wisdom Scale (SAWS; Webster, 2003). Besides, there are performance measurements such as the Grossmann's Wise Reasoning (GWR; Grossmann et al., 2010), and the Berlin Wisdom Paradigm (BWP; Baltes & Smith, 1990). The BWP includes an individual's general evaluation and insight towards challenging life situations from an observer's point of view while the GWR involves reflecting on one's own life.

Both self-reported and performance measurements of wisdom have advantages and disadvantages (Cambaz & Ünal, 2023; Glück, 2018; Glück et al., 2013). Accordingly, self-report measurements are easy to apply but have problems such as social desirability and lack of context. While performance measurements have context and generally have no problem with social desirability, the application of performance measurement is costly because the answers of participation pass through the coding process by the evaluator. Still, both measurements complement each other (Snyder et al., 2021), and both are tapping different aspects of wisdom, and using both together is suggested (Cambaz & Ünal, 2023; Friedman & Banich, 2019). In the present study, both self-reported and performance measurements were used. The Self-Assessed Wisdom Scale (SAWS) as a self-report measurement, the Grossmann's Wise Reasoning (GWR), and the Berlin Wisdom Paradigm (BWP) as performance measurements were used. There are few studies in Turkish literature that examine the concept of wisdom. Those that do, such as the works of Cambaz and Ünal (2023) and Ünal (2021), approach wisdom from a psychological perspective and generally utilize conceptualizations and models from the global literature. Thus, more studies are needed in Turkish literature for wisdom with the perspective of psychology, and the current study aims to fill this gap in the literature.

1.1.1. Berlin Wisdom Paradigm

There are different models that attempt to explain wisdom. Some of these are the Berlin Wisdom Paradigm (Baltes, & Smith, 1990), the Grossmann's Wise Reasoning (Grossmann et al., 2010), the Balance Theory of Wisdom (Sternberg, 1998), the MORE Life Experience Model (Glück & Bluck, 2013), and the Brown's Model of Wisdom Development (Brown, 2004). In the Berlin Wisdom Paradigm, wisdom is treated as "expert knowledge". Accordingly, the individual has comprehensive and deep knowledge in a particular field. This information is learned through experience and practices in that field (Glück, 2018). As a performance measurement of wisdom, the BWP takes the participant's response verbally or written with a hypothetical scenario. This scenario is about what must be considered or done in a difficult life problem. After that, the participant's answers evaluated by raters within the frame of five BWP criteria: factual knowledge, procedural knowledge, life-span contextualism, relativism, and uncertainty (Baltes & Smith, 1990; Staudinger et al., 1994).

1.1.2. Grossmann's Wise Reasoning

In the Grossmann's Wise Reasoning (Grossmann et al., 2010), similar to the BWP, participants' responses are evaluated based on specific criteria. However, unlike the BWP, the GWR asks participants about a recent difficult life event, requesting details such as location, time, and individuals involved. Participants are then asked to reflect on the event, and the resulting responses are evaluated by raters using specific metacognitive strategies as criteria. These strategies indicate wise reasoning, and include recognition of the limits of one's knowledge, recognition of the many possible ways a situation may unfold, consideration of different perspectives in the narrative, integration of these perspectives, and search for resolution.

1.1.3. The Balance Theory of Wisdom

The Balance Theory of Wisdom defines wisdom as the application of intelligence, common sense, creativity, and experience, mediated by values towards achieving a common good through balancing (a) personal, (b) interpersonal, and (c) extrapersonal interests. This involves achieving balance in the short or long term through (a) adapting to existing environments, (b) shaping existing environments, or (c) selecting new environments (Sternberg, 1998). According to Sternberg, schools aim to provide content knowledge and develop cognitive skills without emphasizing the importance of being wise. But teaching wisdom must be included in the curriculum in the schools and methods aimed at increasing wisdom should be implemented (Sternberg, 2004; Vasodavan et al., 2021).

1.1.4. The MORE Life Experience Model

The MORE Life Experience Model (Glück & Bluck, 2013), which examines wisdom from a developmental perspective, discusses the interaction of certain resources and experiences in the development of wisdom. These resources are mastery, openness, reflection, and emotion regulation/empathy. These resources are important in the development of wisdom. Individuals use these resources to evaluate the challenges they face, to cope with these challenges, and to integrate these challenges into their life stories. If these resources are high in an individual, they strengthen each other over time and thus create a ‘positive sign’ that helps them cope with the challenges in their lives. Individuals with this positive sign are likely to develop a high level of wisdom in their lives (Glück & Bluck, 2013).

1.1.5. The Brown's Model of Wisdom Development

Another model that examines wisdom from a developmental perspective is the Brown's Model of Wisdom Development (Brown, 2004). In this model, wisdom is considered in terms of various dimensions: self-knowledge, understanding others, sound judgment, knowledge and skills related to life, and willingness to learn. The individual learns while interacting with their environment and brings with them a background in this learning process. This background includes certain attitudes, motivations, experiences, and expectations. In this two-way and dynamic process, the individual influences the environment as much as the environment influences the individual.

1.2. Executive Functions

"Executive Functions" (i.e., EF) is a general term that refers to the control functions of the pre-frontal cortex (Best et al., 2009; Logan et al., 2014). It is an umbrella term that encompasses many cognitive abilities (Munakata, & Michaelson, 2021) such as our adaptive, control-focused interaction abilities with stimuli from within or outside (Hofmann, 2012). Individual can engage restricted EF at any given moment, because of limited capacity in EF (Baddeley & Hitch, 1974). Executive functioning is sometimes characterized with 'hot' cognitive processes engaged with emotional situations, while characterized with 'cold' processes that are not necessarily engaged with emotions. Hot executive functions encompass impulse control, delay of gratification, emotion regulation and persistence, while the cold ones encompass goal maintenance, inhibitory control, shifting, and working memory (Munakata & Michaelson, 2021). Accordingly, neuropsychologists conceptualized attentional control as executive functioning, while experimental psychologists conceptualized it as working memory and both share a common underlying executive attention component (McCabe et al., 2010).

The consideration of completely independent EF processes is a controversial issue, as EFs such as cognitive flexibility occur with the interaction of different cognitive mechanisms (Ionescu, 2012). Nonetheless, studies on EFs generally reduce EF ability to some specific aspects and operationalize it with specific tasks, such as the n-back task (Kirchner, 1958), Stroop task (MacLeod, 2005), cognitive flexibility task (Cambaz & Ünal, 2021), go/no-go task, and stop/signal (inhibition) task (Eagle et al., 2008). The most well-known EFs are working memory operations (updating and monitoring), inhibition, and task-switching, according to an influential taxonomy (Hofmann et al., 2012; Miyake et al., 2000).

People use EF while interacting every single events deliberately or indeliberately (Friedman & Robbins, 2022; Hoffmann et al., 2012; Monsell, 2003; Munakata, & Michaelson, 2021). So, EF is important in terms of several life outcomes. Accordingly, EF is important for attaining goals, attaining academic achievements, and adapting to novel life situations, socioemotional skills, health, wealth, public safety, and employment (Gunzenhauser & Nückles, 2021; Hoffmann et al., 2012; Munakata & Michaelson, 2021). It also has significant relationship between social adaptation and intelligence (Schulte et al., 2022). There are approaches for training EF, such as practicing EF tasks, classroom curricula, mindfulness (Diamond & Ling, 2020). These methods can help improve individuals' abilities to achieve real-life outcomes, such as academic success. Studies show that while improving executive functioning with these methods is successful, it is more difficult to transfer these improvements to academic achievements (Gunzenhauser & Nückles, 2021). So, considering the importance EF in everyday life, it is inevitable to expect it to be significant in developing wisdom. For this aim, inhibition and task-switching specifically were used in the current study.

1.2.1. Working Memory

Working memory is a control system that has limited processing and storage (Baddeley & Hitch, 1974). According to well-proven Baddeley and Hitch's multicomponent model of working memory, there are three main components of working memory: (i) phonological loop (2: articulatory loop, acoustic store), (ii) visuo-spatial scratchpad, and (iii) episodic buffer (Baddeley, 2000). These three components are attached to central executive which has administrative role in working memory. Central executive is responsible for directing to attention updating and maintaining relevant information and keeping information accessible when necessary. It coordinates the subordinate systems (Baddeley & Hitch, 1974; Kane et al., 2001). Accordingly, phonological loop stores phonological information with a limited capacity by continuously refreshing information or with acoustic store. Besides, visuo-spatial scratchpad is responsible for storing spatial and visual information. On the other hand, episodic buffer is a subordinate system that links long term memory and working memory. Also, episodic buffer is responsible for integration of representations from other subordinate systems such as visual, phonological, or spatial. It also integrates information and representations that possibly not covered by other systems (Baddeley, 2000; Baddeley & Hitch, 1974).

1.2.2. Task-Switching

Task-switching (mental set shifting) refers to the ability to shift between different tasks and different mental sets, selecting rules, and appropriate reactions according to the demands of the situation. In this sense, it indicates the ability to adapt to the current situation and, if necessary, adapt to another situation immediately (Kiesel et al., 2010; Monsell, 2003). Everyday life constantly requires shifting between cognitive tasks, while each cognitive task requires configuration of mental set compatible with demanding stimuli. There is a 'switch

cost' of switching between different cognitive tasks, thus after switching, responses of individual are more error-prone (Monsell, 2003).

There are different measurements such as the Stroop task (MacLeod, 2005), the Wisconsin Card Sorting Test (Kopp et al., 2021) for task-switching. For instance, in the PsyToolkit version of task-switching (Stoet, 2010; Stoet, 2017), the participant must remember the rules based on the letter or number according to the position in which the stimulus is presented and produce the appropriate response within a short period. Based on whether the letter is a vowel or consonant and whether the number is odd or even, the participant must produce the appropriate response and repress the inappropriate one. In this sense, the participant is involved in a complex process, including remembering the relevant set and rules, holding the appropriate response for the relevant rule in mind, and exhibiting the response. Generally, the participant should adapt to the process according to the instructions and demonstrate this throughout all blocks and stimuli. Therefore, the task-switching task is a serious indication of executive function capacity and ability, specifically set-shifting (Monsell, 2003).

1.2.3. Inhibition

Inhibition refers to “the ability to deliberately inhibit dominant, automatic, or prepotent responses when necessary” (Miyake et al., 2000, p. 57). Also, it includes stopping an ongoing response pattern for permitting to continue response or delaying in the decision and suppressing interfering information when necessary (Barkley, 1999). Some fMRI studies demonstrate that inhibition is linked to activation of frontal lobe. But which region is being activated in response inhibition is task dependent such as the task being simple or complex (Simmonds et al., 2008). This inhibition should not be confused with positive/negative priming activation levels in activation models and connectionist networks, which increase

and decrease. The automatic response resulting from this activation is not necessarily intended (Logan et al., 2014; Miyake et al., 2000). The inhibition referred to in Miyake and Friedman's model is an intentional control behavior produced internally.

Inhibition is important in daily life with many ways. It allows organism to select appropriate responses consistent with the situation and goals. Thus, it limits the unwanted action and thoughts while helping behavioral accommodation (Schulte et al., 2022). It has also social function that prevents undesirable impulses such as hitting someone, not using substance, etc. (Thomsen et al., 2018; Wegmann et al., 2020). It is also important in academic success and learning because it allows to restrain previous learned patterns and to develop new ones (Pascual et al., 2019). Also, studies show a significant relationship between social cognition, intelligence, and inhibition (Honoré et al., 2020; Lee et al., 2015; Schulte et al., 2022). Considering that inhibition has so many social outcomes, it is inevitable to expect significant relationships with wisdom, as well.

Inhibition was measured with several ways such as the go/no-go task, and the stop/signal task (Eagle et al., 2008). For example, in the PsyToolkit version of the go/no-go task (Stoet, 2010; Stoet, 2017), participants must consciously refrain from responding when they see the no-go stimulus. Similarly, when they see the go stimulus, they must inhibit their tendency to continue not responding and respond instead. This task is designed to measure inhibition ability, particularly, due to its simplicity. Although it may appear to be a simple task (Simmonds et al., 2008), as the number of trials increases, it is seen that participants find it increasingly difficult to inhibit their desire to press the button.

1.3. Wisdom and Executive Functions

The concept of wisdom inherently encompasses many different characteristics (Grossmann et al., 2020). From a psychological perspective, the notion of wisdom has been conceptualized and measured in various ways, such as the Three-Dimensional Model of Wisdom (Ardelt, 2004), the Grossmann's Wise Reasoning (Grossmann et al., 2010), or the Berlin Wisdom Paradigm (Baltes & Smith, 1990). In its operationalized form, measures of wisdom reduce the wisdom concept to a certain framework by the nature of measurement. This framework, as used in the Berlin Wisdom Paradigm in the present study, demonstrates how participants consider certain strategies and knowledge when faced with a challenging life event. Another performance measurement, the Grossmann's Wise Reasoning, also indicates the extent to which certain metacognitive strategies are used. These strategies that point to wise reasoning indicate that individuals will act wisely if they use these metacognitive strategies in any event or conflict situation they encounter in their life. These metacognitive strategies have been reduced to five dimensions and are fundamental strategies utilized by individuals to resolve conflicts (Santos et al., 2017). However, the relationship between these metacognitive strategies indicating wisdom and executive function, a higher cognitive process, remains understudied. Specially task-switching and inhibition was used for this purpose in the current study.

1.3.1. Wisdom and Inhibition

Inhibition is one of the fundamental abilities in one's life, such as attaining goals, reacting properly to demanding situations, managing social interactions, and achieving academic success (Barkley, 1999; Miyake et al., 2000; Pascual et al., 2019; Schulte et al., 2022). Current literature emphasizes the importance of inhibition in achieving goals but does not specify what to inhibit or what not to inhibit. In the development of wisdom and life-

span development, individuals should possess intellectual abilities and follow appropriate standards to achieve the common good, including knowing what to inhibit. There are performance-focused approaches in the schools (Sternberg, 2004), however, integrating the abilities, intelligence, academic achievements, and personal experience to serve higher purpose is not given the deserved importance. As an example, self-distancing, which is linked to higher levels of wise reasoning (Grossmann et al., 2017), and indicates the inhibition of self-serving responses linked to wisdom, is not being taught enough.

The study of wisdom emphasizes the importance of living in harmony and resolving conflicts (Santos et al., 2017). Wisdom has been associated with several positive life outcomes such as less negative affect, less rumination. And also it has been linked to greater life satisfaction and longevity (Grossmann et al., 2013). Thus, understanding inhibition with development of wisdom is important from this point of view. Wisdom can teach us to inhibit our mindless desire to achieve dominance such as making nuclear bombs and using our ability to splitting atom for higher purpose. Consequently, the inhibitory control is important for generating wise responses such as not saying the first thing that comes to mind, avoiding impulsive actions, not reaching a conclusion without knowing all the facts (i.e., having intellectual humility), and making an effort to provide a better response rather than the first one that comes to mind (Diamond, 2013).

1.3.2. Wisdom and Task-Switching

Task-switching is an important executive function in terms of changing mental sets when required and producing an appropriate response to the stimulus encountered by the individual. In this sense, task-switching holds an important place in adapting to the current situation and adjusting to new situation when the stimulus changes (Kiesel et al., 2010; Monsell, 2003). Therefore, individuals should use mind-sets that include appropriate criteria

and metacognitive strategies related to wisdom and wise reasoning when responding to conflict resolution in daily life or performance measurements (Baltes & Smith, 1990; Grossmann et al. 2010). Hence, for wisdom, individuals should change their self-serving mind-sets and utilize mind-sets that serve a transcendent purpose for the common good (Grossmann, 2017; Santos et al., 2017; Sternberg, 1998; Wong, 2016). Therefore, the appropriate use of task-switching can hold an important place in terms of wisdom.

1.3.3. Wisdom and EF from Self-regulatory Perspective

Research suggests that people use the prefrontal cortex's control function (EF) while interacting with every event (Friedman & Robbins, 2022; Hofmann et al., 2012; Roebbers, 2017). If an individual uses their emotions, thoughts, and behaviors to serve the common good with the proper use of control function, wise reflection occurs (Santos et al., 2017; Sternberg, 1998). Therefore, it is plausible to expect a relationship between EF and wisdom-related processes that require metacognitive skills for self-regulation during conflict resolution (Grossmann et al., 2010; Hofmann et al., 2012; Santos et al., 2017). According to this view, the three main components of self-regulation include: (i) the mental representation of the individual's behavioral, cognitive, and emotional perspective, as well as the standards that are monitored and understood; (ii) the individual's display of sufficient motivation to reduce the difference between the current situation and the standards; and (iii) the individual's capacity to reach their goals despite all the obstacles and temptations that arise during the process. In summary, this self-regulatory process requires capacity, motivation, and understanding of standards (Hofmann et al. 2012; Miyake et al., 2000). The capacity aspect of this process is represented by EF (Hofmann et al., 2012). Therefore, the individual must be involved in a certain self-regulatory process by using the current wisdom-related metacognitive strategies. And this self-regulatory process requires a certain capacity (i.e.,

EF). Hence, it can be said that EF represents the capacity and functions that the individual must have in the process leading to wisdom. Accordingly, performance in the EF measurement not only reflects core stable capacities, but also reflects diverse social contextual factor that may influence further engaging in executive functioning (Munakata & Michaelson, 2021).

In the development of wisdom and the expression of wise responses, the connections between self-regulatory mechanisms and executive functions (EF) can shed light on this matter. For example, the importance of inhibition as an EF has been demonstrated in the suppression of prepotent impulses and mindless behavior (Hofmann et al. 2012; Miyake et al., 2000). It has been shown that individuals who are inadequate in inhibiting impulses in self-regulatory processes experience various problems in different aspects of social life, such as substance use (Thomsen et al., 2018) and romantic relationship problems (Pronk et al., 2011). Moreover, task switching is associated with self-regulatory processes such as flexible switching, mean shifting, and goal shifting (Hofmann et al., 2012). Hofmann suggests that task switching can be related to self-regulatory processes in two ways. Firstly, through task switching, individuals can shift to alternative means (means-shifting) by abandoning less optimal tools (which are high-cost). Secondly, task switching can enable an individual to shift from one self-regulatory goal to another (goal-shifting). Therefore, wisdom as a self-regulatory process can be associated with EF in these aspects.

In summary, there may be various ways in which EF supports wisdom. For instance, when giving wise responses that compatible with situation demands, an individual needs to manage and regulate their emotions appropriately (Wranik et al., 2007). EF, which involves the ability to direct attention and behavior, is important in the development and demonstration of wisdom. Therefore, when faced with a moral dilemma or a difficult life event, EF skills are crucial for considering (i.e., updating) relevant information and

perspectives (reflection), switching schemas and responses to meet demands as needed (shifting), suppressing self-serving responses (inhibition), and using all of these abilities to serve the common good (Hofmann et al., 2012; Santos et al., 2017; Sternberg, 1998).

1.4. Current Study

The study aims to examine wisdom in Turkish culture from a psychological perspective. Specifically, it aims to explore the relationship between wisdom and executive functions, with a focus on two executive functions: inhibition and task switching. The study also investigates the relationship between different measures of wisdom, as well as the relationship between demographic variables and wisdom. To achieve these objectives, both performance measures (GWR, BWP) and self-reported measure (SAWS) were used. The research questions are as follows:

RQ 1: Is there a relationship between wisdom and executive functions?

RQ 2: What is the relationship between different types of measurements of wisdom, self-report, and performance, from a psychological perspective?

RQ 3: Do wisdom measurements differ based on different demographic variables?

2. METHOD

2.1. Participants

The sample of the study consists of 149 participants (132 females) who are university students at a state university in Ankara, Turkey. The age of the participants ranges between 18-36 ($M = 21.59$, $SD = 1.79$). Most of the participants are university students in a bachelor's degree program, generally from the psychology department. The demographic properties of the participants are presented in the Table 1. Participation in the study was voluntary and they took additional points for certain lessons for their participation. Before the study, ethical approval was taken from Social and Human Sciences Ethics Committee of Ankara Yildirim Beyazit University on 06.01.2022 with the 2021-610 document number (see Appendix G).

Table 1. The demographic properties of the participants

		N	%
Gender	Male	17	11.41
	Female	132	88.59
	Total	149	100.00
Income	Well below Turkey's average	4	2.68
	Below Turkey's average	29	19.46
	In Turkey average	89	59.73
	Above Turkey's average	25	16.78
	Well above Turkey's average	2	1.34
	Total	149	100.00
Mothers Education Level	Primary school	45	30.20
	Elementary School	32	21.48
	High school	46	30.87
	University	26	17.45
	Total	149	100.00
Fathers Education Level	Primary school	17	11.41
	Elementary School	33	22.15
	High school	37	24.83
	University	62	41.61
	Total	149	100.00
Living Place	Village	7	4.70
	Town	21	14.09
	City	34	22.82
	Metropolitan	87	58.39
	Total	149	100.00

2.2. Measurements

2.2.1. Grossmann's Wise Reasoning (GWR)

As a measure of wisdom performance, the Grossmann's Wise Reasoning paradigm (Grossmann et al., 2010) was utilized in the current study. The participants were asked to recall a recent difficult social situation they had encountered and provide specific details such as when, where, which day, which hour, and what they were doing during that situation (see Appendix A for the questions and detailed instructions). Participant responses were evaluated by two blinded raters based on five criteria: (i) recognition of limits of knowledge, (ii) recognition of the many ways the situation may unfold/recognition of the possibility of

change, (iii) consideration/recognition of different perspectives in the narrative, (iv) integration of perspectives/compromise, and (v) search for resolution. Raters used a 0-4 Likert scale (0= nothing is mentioned about the theme, 4= a few examples of the theme are mentioned and 2+ explained in depth) for each criterion, and the participants received points ranging from 0 to 20. Higher scores on the task indicates usage of more metacognitive strategies of GWR and overall higher wise reasoning performance. The first rater evaluated the responses of all participants, and the second rater examined 20% of the responses. Inter-rater reliability was found to be .57, indicating moderate reliability, based on intraclass correlation coefficient analyses (two-way random, consistency; Koo & Li, 2016). Please see the Table 2 for the related statistics.

Table 2. Intraclass correlation coefficient analyses (GWR)

	Intraclass Correlation	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	0.573	.273	.771	3.679	29	29	.000

2.2.2. Berlin Wisdom Paradigm (BWP)

For the other performance measure of wisdom, the Berlin Wisdom Paradigm (Baltes & Smith, 1990) was used. The participants were asked to respond to a hypothetical difficult life situation and provide their suggestions for resolving the problem presented in the given vignette (please see Appendix B for the vignette, questions, and detailed manual). The participants' responses were examined by double-blinded raters based on five criteria: (i) factual knowledge, (ii) procedural knowledge, (iii) lifespan contextualism, (iv) relativism, and (v) uncertainty (Baltes & Smith, 1990; Staudinger et al., 1994). Raters used a 1-7 Likert scale (1 = low performance for the criterion, 7 = high performance for the criterion) for each criterion, and participants received scores ranging from 7 to 35. Higher scores on the task

indicates higher performance in the dimensions of BWP and overall general wisdom. The first rater evaluated the answers of all participants, and the second rater examined 20% of the answers. Inter-rater reliability was found to be .52, indicating moderate reliability, based on intraclass correlation coefficient analyses (two-way random, consistency; Koo & Li, 2016). Please see the Table 3 for the related statistics.

Table 3. Intraclass correlation coefficient analyses (BWP)

	Intraclass Correlation	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	0.524	.214	.738	3.203	30	30	.001

2.2.3. Self-Assessed Wisdom Scale (SAWS)

The Turkish version of the Self-Assessed Wisdom Scale (SAWS; Webster, 2003), adapted by Turgut and Nazlı (2019), was used as a self-report measurement of wisdom. It is a 35-item (for example: “I have overcome many painful events in my life; It is easy for me to adjust my feelings to the current situation”), 1-6 Likert scale (1=not agreed, 6=totally agreed) with five factors: emotion regulation, reflection, experience, humor, and openness. The Cronbach alpha internal consistency of the scale was found to be .90, split-half reliability was found to be .87, and test-retest reliability was found to be .91 in Turgut and Nazlı's study. The five-factor structure of the original scale was found to be valid and reliable in Turkish culture (see Appendix C for the scale). The Cronbach alpha internal consistency of the scale was found to be .87, split-half reliability was found to be .84 for the current study. An increase in the score on the scale indicates higher self-reported wisdom.

2.2.4. Task-Switching Task

Task-switching which is in PsyToolkit Library (Stoet, 2010; Stoet, 2017) was used in the current study (see Appendix D for the exemplar pictures). The aim of this task is to measure task-switching ability of participants. There are two main outputs of the task: (i) error in mental-set shifting (task-switching) and (ii) reaction time. There are three blocks in the task, which is in order of letters block, numeric block, and mixed block. There are 40 trials for every block, thus there are 120 trials in total. Participants can get score ranging between 0-120. Each stimulus is presented as a maximum of 5000 ms. Participants were firstly instructed about the structure of the task. Accordingly, letter/number combinations were presented to the participants. Participants should response with two button of keyboard which is 'B' and 'N'. If the letter/number combination was presented in the top of the screen, participants should respond according to letter rule, while if it was presented in the bottom of the screen, participants should respond according to numbers rule. According to "letter" rule, if participants see consonant (G, K, M, R) then they should respond with 'B', while if they see vowel (A, E, I, U) then they should respond with 'N'. According to "numbers" rule, if participants see odd number (3, 5, 7, 9) then they should respond with 'B', while if they see even number (2, 4, 6, 8) then they should respond with 'N'. In the case of error or not pressing the button, a reminder box in the side of the screen was presented to participants.

2.2.5. Go/No-Go Task

Go/no-go task which is in PsyToolkit Library (Stoet, 2010; Stoet, 2017) was used for measuring inhibition in the current study (see Appendix E for exemplar pictures). The aim of this task is to measure inhibition ability of participants. There are two main outputs of the task: (i) error in inhibition and (ii) reaction time. There are 75 trials in total, 60 for 'GO' stimulus and 15 for 'NO-GO' stimulus. Participants can get score ranging between 0-75.

Each stimulus is presented as a maximum of 2000 ms. Participants were firstly instructed about the structure of the task. Accordingly, participants should press ‘space’ button when they see ‘GO’ stimulus in the screen, while they should not press the button when they see ‘NO-GO’ stimulus. In the case of error, a reminder box was presented in the screen. Go/No-Go task was used twice in the study which is before the wisdom measurements and after the wisdom measurements, for examination of change in the inhibition performance.

2.2.6. Demographic Form

A demographic form was used to gather demographic information (age, gender, father’s education level, mother’s education level, place where most of life is spent, and income) about the participants (see Appendix F for the demographic form).

2.3. Design

The study has both correlational and experimental designs. The correlational design was used to investigate the strength of the relationship between variables in the study, especially executive function (EF) and wisdom measurements. It was also used to investigate the relationship between demographic variables and EF and wisdom. Additionally, a within-subject experimental design with one group pre-post test was used to investigate changes in inhibition between the beginning and the end of the study. The go/no go task was used twice, at the beginning and at the end of the study, to investigate changes in inhibition depending on wisdom measurements and the possible relationship between specific wisdom dimensions and inhibition. Thus, this experimental design provides an examination of the changes in inhibition and reaction time performance in go/no go task (DV) depending on wisdom measurements (IV). Also, it provides to examine the effect of EF usage (IV) on wisdom measures (DV). For this examination, the change in

inhibition performance in second go/no go task was coded as reference to the first one as follows; -1 = decrease, 0 = unchanged, 1 = increase.

2.4. Procedure

The study was conducted online using PsyToolkit (Stoet, 2010; Stoet, 2017). Participants were required to approve the consent form (see Appendix H) before proceeding. The study involved several tasks, beginning with the completion of the task switching and the go/no-go task. The participants then completed the two wisdom performance measurements (the Grossmann's Wise Reasoning and the Berlin Wisdom Paradigm) and the SAWS. Afterward, the participants completed the go/no-go task again before filling in the demographic information form. Finally, the participants were thanked for their participation. The study lasted approximately 20-25 minutes in total.

2.5. Data Analysis

IBM SPSS Statistics v23 (IBM Corp., 2015) was used for descriptive analysis of all variables, correlational analysis between all variables, Paired Sample T-Test analysis for examining inhibition change, and ANOVA analysis examining the effect of demographic variables on EF and wisdom. The structural equation modeling analysis was conducted using IBM SPSS Amos v24 (Arbuckle, 2016) to examine the covariance between EF and wisdom and to examine the regression model for demographic variables and EF on wisdom.

3. RESULTS

3.1. Descriptive Statistics

Descriptive statistics for the variables presented in the Table 4.



Table 4. Descriptive statistics for the variables

Variables	N	Min	Max	Mean	SD
Task-switching					
Letter block					
Correct	149	26.00	40.00	38.30	2.11
Response Time	149	597.85	2311.13	945.05	242.50
Numeric block					
Correct	149	32.00	40.00	37.97	1.63
Response time	149	560.45	1529.00	880.18	156.11
Mixed block					
Correct	149	21.00	40.00	36.82	3.61
Response time	149	746.45	2516.70	1470.61	316.45
Total error	149	0.00	41.00	6.91	5.81
Total response time	149	2257.13	5301.35	3295.84	576.88
First go/no go task					
Reaction time	149	271.62	640.52	437.30	70.39
Total error	149	0.00	6.00	1.36	1.38
Second go/no go task					
Reaction time	149	279.83	700.67	420.78	75.11
Total error	149	0.00	6.00	1.36	1.24
Wisdom-Berlin Wisdom Paradigm					
Factual knowledge	149	1.00	7.00	4.17	1.45
Procedural knowledge	149	2.00	7.00	4.65	1.24
Life-span contextualism	149	1.00	7.00	3.97	1.50
Relativism	149	1.00	7.00	3.97	1.34
Uncertainty	149	1.00	7.00	4.06	1.31
BWP total	149	8.00	31.00	20.81	4.45
Wisdom-Grossmann's Wise Reasoning					
Recognition of Limits of Knowledge	149	0.00	4.00	0.87	0.80
Many Ways Situation May Unfold	149	0.00	3.00	0.82	0.78
Perspectives in the Narrative	149	0.00	4.00	1.21	0.82
Integration of Perspectives/Compromise	149	0.00	4.00	1.05	0.90
Search for Resolution	149	0.00	3.00	0.92	0.80
GWR total	149	0.00	15.00	4.88	2.60
Self-Assessed Wisdom Scale					
Emotion regulation	149	11.00	47.00	32.26	6.38
Reflection	149	14.00	42.00	30.28	6.14
Experience	149	10.00	36.00	25.20	5.65
Humor	149	17.00	42.00	30.36	5.45
Openness	149	13.00	42.00	30.03	5.78
SAWS total	149	85.00	195.00	148.13	19.77

3.2. Correlational Analyzes

3.2.1. Correlation of age and income

According to the correlation analysis that examined RQ 3, age has no correlation with any of the variables. The perception of higher income only has a positive correlation with the uncertainty of the BWP ($r = 0.25, p < .001$) (see Appendix I, Table 9 for correlation among variables).

3.2.2. Correlation among the EF Tasks

The correct response of the participants in task switching B1 letter trial (Block 1) is significantly; negative correlated with response time in B1 ($r = -0.42, p < .001$), positively correlated with correct response in B2 numerical trial (Block 2, $r = 0.32, p < .001$), positively correlated with correct response in B3 mixed trial (Block 3, $r = 0.54, p < .001$), negatively correlated with the total error in all switching task ($r = -0.79, p < .001$), negatively correlated with total response time in all switching task ($r = -0.18, p < .05$), negatively correlated with the total error in the second go/no-go task total error ($r = -0.18, p < .05$).

The correct response of the participants in the task switching numeric trial (Block 2) is significantly; negative correlated with response time in B2 ($r = -0.16, p < .05$), positively correlated with correct response in B3 mixed trial ($r = 0.27, p < .01$), negatively correlated with the total error in all switching task ($r = -0.56, p < .001$), negatively correlated with the total error in the first go/no-go task total error ($r = -0.18, p < .05$),), negatively correlated with total error in the second go/no-go task ($r = -0.23, p < .01$).

The correct response of the participants in task switching mixed trial (Block 3) is significantly; negative correlated with response time in B1 ($r = -0.28, p < .001$), positively

correlated with correct response in B2 numerical trial (Block 2, $r = 0.27, p < .01$), negative correlated with response time in B2 ($r = -0.27, p < .01$), negatively correlated with total error in all switching task ($r = -0.89, p < .001$).

The total error in all trials of task-switching is significantly; positively correlated with the total response time in all switching task ($r = 0.24, p < .01$), positively correlated with the total error in both go/no-go task ($r = 0.19, p < .05$). Also, the total response time in all trials of task-switching is significantly positively correlated with the reaction times in go/no-task; first ($r = 0.31, p < .001$), second ($r = 0.24, p < .001$) and total ($r = 0.32, p < .001$) of both go/no-go task.

In the first go/no-go task, the reaction time is negatively correlated with the total error ($r = -0.29, p < .001$). But in the second go/no-task, the reaction time is not significantly correlated with the total error ($r = -0.04, p > .05$).

3.2.3. Correlation among Wisdom Measurements

Correlations among wisdom measurements were examined to address RQ 2. The total score of the BWP has only significant positive correlation with recognition of limits of knowledge of the GWR ($r = .16, p < .05$). Factual knowledge of the BWP is significantly positively correlated with integration of perspectives/compromise of the GWR ($r = .16, p < .05$). Procedural knowledge of the BWP is significantly negatively correlated with recognition of possibility of change of the GWR ($r = -.20, p < .05$) and negatively correlated with humor dimension of the SAWS ($r = -.18, p < .05$). Life-span contextualism of the BWP has positive correlation with total score of the GWR ($r = .19, p < .05$).

The total score of the GWR has significant negative correlation with total score of the SAWS ($r = -0.19, p < .05$), experience dimension of the SAWS ($r = -0.27, p < .05$), and

openness dimension of the SAWS ($r = -0.17, p < .05$). Recognition of possibility of change of the GWR has negative correlation with experience dimension of the SAWS ($r = -0.20, p < .05$). Consideration of perspectives of the GWR has negative correlation with total score of the SAWS ($r = -0.17, p < .05$), emotion regulation dimension of the SAWS ($r = -0.17, p < .05$) and experience dimension of the SAWS ($r = -0.18, p < .05$). Integration of perspectives/compromise dimension of the GWR has negative correlation with total score of the SAWS ($r = -0.17, p < .05$), openness dimension of the SAWS ($r = -0.17, p < .05$). Search for resolution dimension of the GWR has negative correlation with experience dimension of the SAWS ($r = -0.20, p < .05$).

3.2.4. Correlation between EF and Wisdom

Correlation between EF and Wisdom were examined to address RQ 1. Uncertainty dimension of the BWP is significantly; positively correlated with correct response of the participants in task switching B2 numeric trial ($r = 0.17, p < .05$).

Reaction time in second go/no-go task is negatively correlated with recognition of limits of knowledge criteria of the GWR ($r = -0.19, p < .05$). The total error in the second go/no-go task is negatively correlated with the total score of GWR ($r = -0.17, p < .05$).

The total reaction time in both go/no-go task is negatively correlated with recognition of limits of knowledge criteria of the GWR ($r = -0.20, p < .05$). Also, the total reaction time in both go/no-go task is negatively correlated with openness dimension of the SAWS ($r = -0.19, p < .05$).

3.3. Group Differences

3.3.1. Group Differences for Demographic Variables

3.3.1.1. Gender Differences

Gender differences were examined to address RQ 3. There are gender differences for the total score of the BWP, $F(1,147) = 4.15, p < .05$, for the males ($M = 18.76, SD = 5.32$), for the females ($M = 21.08, SD = 4.45$). There are gender differences for procedural knowledge of BWP, $F(1,147) = 7.77, p < .01$, for the males ($M = 3.88, SD = 1.32$), for the females ($M = 4.75, SD = 1.19$). There are gender differences for relativism of the BWP, $F(1,147) = 6.69, p < .01$, for the males ($M = 3.17, SD = 1.29$), for the females ($M = 4.07, SD = 1.31$).

There are gender differences for experience dimension of the SAWS, $F(1,147) = 4.02, p < .05$, for the males ($M = 27.26, SD = 4.53$), for the females ($M = 24.87, SD = 5.71$); and reaction time in the first go/no-go task, $F(1,147) = 4.04, p < .05$, for the males ($M = 405.35, SD = 69.63$), for the females ($M = 441.42, SD = 69.68$) (see Table 5 for all gender differences).

Table 5. Gender differences

<i>df</i> (3,145)	Male (N =17)		Female (N =132)			
Variables	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>F</i>	<i>p</i>
Task-switching						
Total error	6.88	5.28	6.92	5.89	0.00	0.98
Total response time	3194.78	666.88	3308.85	565.83	0.59	0.44
First go/no go task						
Reaction time	405.35	69.64	441.42	69.68	4.04	0.05*
Total error	1.59	1.37	1.33	1.38	0.54	0.46
Second go/no go task						
Reaction time	416.44	91.47	421.34	73.13	0.06	0.80
Total error	1.88	1.54	1.29	1.19	3.51	0.06
Wisdom-Berlin Wisdom Paradigm						
Factual knowledge	3.71	1.61	4.23	1.43	1.95	0.17
Procedural knowledge	3.88	1.32	4.75	1.19	7.77	0.01*
Life-span contextualism	4.18	1.85	3.94	1.45	0.38	0.54
Relativism	3.18	1.29	4.07	1.31	6.96	0.01*
Uncertainty	3.82	1.47	4.09	1.29	0.63	0.43
BWP total	18.76	5.32	21.08	4.27	4.15	0.04
Wisdom-Grossmann's Wise Reasoning						
Recognition of Limits of Knowledge	1.12	0.93	0.84	0.78	1.81	0.18
Many Ways Situation May Unfold	1.06	0.90	0.79	0.76	1.83	0.18
Perspectives in the Narrative	1.12	0.78	1.22	0.83	0.23	0.63
Integration of Perspectives/Compromise	0.88	0.99	1.08	0.89	0.70	0.41
Search for Resolution	0.76	0.90	0.94	0.79	0.71	0.40
GWR total	4.94	3.53	4.87	2.47	0.01	0.92
Self-Assessed Wisdom Scale						
Emotion regulation	34.35	6.23	31.99	6.37	2.08	0.15
Reflection	29.35	5.90	30.40	6.19	0.44	0.51
Experience	27.76	4.53	24.87	5.71	4.02	0.05*
Humor	30.82	5.84	30.30	5.42	0.14	0.71
Openness	30.00	4.77	30.03	5.92	0.00	0.98
SAWS total	152.29	16.28	147.60	20.17	0.85	0.36

3.3.1.2. Mother's Educational Level

The effect of mother's educational level was examined to address RQ 3. According to One-way ANOVA, there are overall group differences in mother's educational level for the total error in task-switching, $F(3,145) = 3.19, p < .05$. But according to Dunnett's C (equal variances not assumed) post-hoc multiple comparisons, there is no significant differences between groups.

There is a significant difference for the total error in the first go/no-go task by mother's educational level, $F(3,145) = 3.78, p < .05$. According to Tukey post-hoc multiple comparisons, the primary school group has significantly lower error in the first go/no-go task than the elementary school group, $p < .01$, CI [-1.80, -.19]. Also, the elementary school group has significantly higher error in the first go/no-go task than the high school group, $p < .05$, CI [.00, 1.61].

There is a significant difference for the total score of the GWR by mother's educational level, $F(3,145) = 3.32, p < .05$. According to Tukey post-hoc multiple comparisons, the elementary school group has significantly higher total score of the GWR than the university group, $p < .05$, CI [.26, 3.74]. Also, there are significant differences for consideration/recognition of perspectives in the narrative, $F(3,145) = 3.12, p < .05$. But according to Dunnett's C (equal variances not assumed) post-hoc multiple comparisons, there is no significant differences between groups.

Lastly, there is a significant difference for reflection dimension of SAWS by mother's educational level, $F(3,145) = 2.80, p < .05$. But according to Tukey post-hoc multiple comparisons, there is no significant differences between groups (see Appendix J, Table 10 for all group differences in mother's educational level).

3.3.1.3. Father's Educational Level

The effect of father's educational level was examined to address RQ 3. According to One-way ANOVA, there is no significant differences in dependent variables by father's educational level (see Appendix K, Table 11 for all group differences in father's educational level).

3.3.1.4. The Effect of Living Place

The effect of living place was examined to address RQ 3. The group differences by the living place in variables has examined. According to One-way ANOVA, the living place make significant differences in reaction time of the first go/no-go task, $F(3,145) = 5.32, p < .01$. According to Tukey post-hoc multiple comparisons, the village livers have lower reaction time in the first go/no-go task than the town livers, $p < .05$, CI [-160.50, -7.38]. The town livers have higher reaction time in the first go/no-go task than the city livers, $p < .01$, CI [18.02, 115.40], and the metropolis livers, $p < .01$, CI [13.34, 98.64].

There is a significant difference for relativism of the BWP by the living place, $F(3,145) = 5.20, p < .01$. According to Tukey post-hoc multiple comparisons, the town livers has significantly higher relativism score of BWP than the metropolis livers, $p < .05$, CI [.02, 1.64]. Accordingly, the city livers have significantly higher relativism score of the BWP than the metropolis livers, $p < .05$, CI [.21, 1.56].

There is a significant difference for search for resolution of the GWR by the living place, $F(3,145) = 3.45, p < .05$. According to Tukey post-hoc multiple comparisons, the town livers has significantly more search for resolution than the metropolis livers, $p < .05$, CI [.07, 1.06] (see Appendix L, Table 12 for all group differences for the living place).

3.3.2. The Effect of Inhibition Changes on Wisdom

The effect of inhibition changes on wisdom was examined to address RQ1. The go/no-go task scores of the participants were coded depending on the change between the first (inhibition measurement taken before wisdom measurements) and the second (taken after wisdom measurements) go/no-go task. Accordingly, if the score in the second task is lower than the first task, this means there is a decrease in the inhibition performance. If it is higher

than the first task, it means there is an increase in inhibition performance. If the task scores are the same for both tasks, it means an unchanged inhibition performance.

A new variable was obtained with subtracting the inhibition performance in second go/no-go task than the first one. After that, the scores lower than 0 was coded as “-1” means “decrease”, the scores equal to 0 was coded as 0 means “unchanged”, the scores higher than 0 was coded as “+1” means “increase” (i.e., “-1” = decrease, “0” = unchanged, “+1” = increase). Thus, these three groups were obtained. The results of the participant in these groups are presented in the Table 6.

Table 6. Frequencies of groups for performance of inhibition

		N	%
Performance of inhibition	Decrease (-1)	49	32.9
	Unchanged (0)	46	30.9
	Increase (1)	54	36.2
	Total	149	100.0

After coding, the effect of inhibition changes on wisdom measurements was examined. According to One-way ANOVA results, only “recognition of many ways situation may unfold” (recognition of possibility of change) of the GWR has significantly differed by inhibition change, $F(2,146) = 3.94$, $p < .05$. According to Tukey post-hoc multiple comparisons, the decrease group (“-1”) has significantly higher points of “recognition of many ways situation may unfold” of the GWR than the increase group (“+1”), $p < .05$, CI [.05, .76] (see Table 7 for other group differences in the effect of inhibition changes).

Table 7. Group differences for the effect of inhibition change

<i>df</i> (2,146)		Decrease (N =49)		Unchanged (N =46)		Increase (N =52)		<i>F</i>	<i>p</i>
Variables		<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>		
Wisdom-Berlin Paradigm	Wisdom								
Factual knowledge		4.18	1.39	4.33	1.43	4.02	1.54	0.56	0.57
Procedural knowledge		4.78	1.19	4.52	1.17	4.65	1.33	0.50	0.61
Life-span contextualism		3.82	1.44	4.04	1.53	4.04	1.53	0.37	0.69
Relativism		4.10	1.37	4.02	1.44	3.80	1.22	0.73	0.49
Uncertainty		4.06	1.39	3.98	1.32	4.13	1.23	0.16	0.85
BWP total		20.94	4.52	20.89	4.57	20.63	4.36	0.07	0.93
Wisdom-Grossmann's Reasoning	Wise								
Limits of Knowledge		0.86	0.71	0.89	0.85	0.87	0.85	0.02	0.98
Many Ways Situation May Unfold		1.00	0.82	0.89	0.85	0.59	0.63	3.94	0.02
Perspectives in the Narrative		1.18	0.91	1.28	0.81	1.17	0.77	0.27	0.76
Integration of Perspectives		0.98	0.88	1.20	0.96	1.00	0.87	0.83	0.44
Search for Resolution		0.90	0.82	1.09	0.84	0.80	0.74	1.68	0.19
GWR total		4.92	2.57	5.35	2.94	4.44	2.27	1.52	0.22
Self-Assessed Wisdom Scale									
Emotion regulation		31.47	6.34	32.59	6.84	32.70	6.06	0.56	0.57
Reflection		31.02	6.05	29.43	5.99	30.33	6.38	0.79	0.46
Experience		25.10	6.46	25.07	5.39	25.41	5.18	0.06	0.95
Humor		30.35	5.42	29.80	5.69	30.85	5.33	0.46	0.64
Openness		29.76	5.63	30.37	6.42	29.98	5.43	0.13	0.87
SAWS total		147.69	21.52	147.26	19.94	149.28	18.22	0.15	0.86

3.3.3. Within-Subject Differences in Go/No-Go Task

The differences between the first (at the beginning of the study) and the second (at the end of the study) the go/no-go task were examined using Paired Samples T-Test. According to analyzes, there is no significant difference in the number of errors between the first and the second task, $t(148) = .00$, $p > .05$, CI [-.26, .26]; $M = 1.36$, $SD = 1.38$ for the first go/no-go, $M = 1.36$, $SD = 1.24$ for the second go/no-go.

But there is significant difference in the reaction time between the first and the second task, $t(148) = 2.68$, $p < .01$, CI [4.34, 28.69]. Accordingly, the first go/no-go ($M = 437.30$,

$SD = 70.39$) has significantly higher reaction time than the second go/no-go ($M = 420.78$, $SD = 75.11$).

3.4. Structural Equation Model (SEM) Analyzes

3.4.1. SEM for EF and Wisdom

Structural Equation Model was performed using SPSS Amos v.24 for further examination of the relationship between EF and wisdom to address RQ 1. Thus, a comprehensive model was achieved examining covariance between higher-order wisdom and higher-order EF variables (see Figure 1). According to Maximum likelihood model fit values, $X^2/df = 1.08$, $p = .24$, GFI = .90, CFI = .97, RMSEA = .02, SRMR = .06, which is in acceptable ranges (Kline, 2015). No modification indices have been performed. Covariance values presented in the Table 8. There is a .43 correlation between EF performance and wisdom which is insignificant according to the model.

Figure 1. SEM covariance model

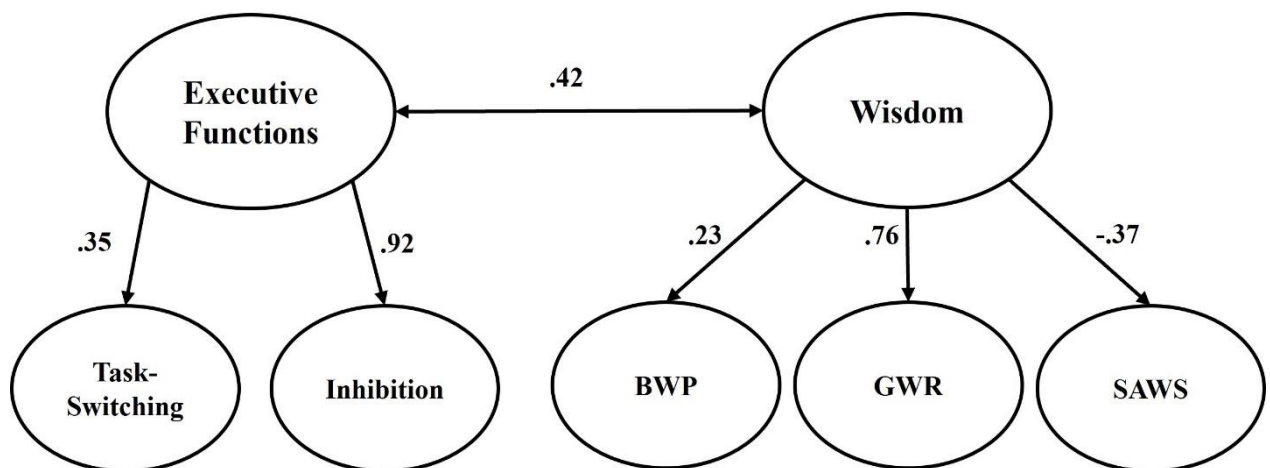


Table 8. Covariance values for SEM for EF and Wisdom

Path	<i>B</i>	<i>SE</i>	C.R.	<i>p</i>
Error in EF<-->Wisdom	-0.05	0.06	-0.81	0.42

3.4.2. A General Regression Model for Wisdom

A general regression model of wisdom was performed using SPSS Amos v.24 Structural Equation Modelling for addressing RQ 1 and RQ 3. Thus, the effect of EF performance, the reaction time, income, age, sex, mother's education level, father's education level, and living place on wisdom performance has examined. Besides, before performing SEM, sex (0 = female, 1 = male), mother's education level (1 = primary school, 0 = others), father's education level (1 = university, 0 = others), the living place (1 = village, 0 = others) coded as dummy variable. Wisdom is conceptualized as higher-order meta variable of the BWP, the GWR and the SAWS. According to Maximum likelihood model fit values, $X^2/df = 1.12$, $p = .06$, GFI = .86, CFI = .91, RMSEA = .03, SRMR = .06, which is in acceptable ranges for p value, CFI, RMSEA and SRMR (Kline, 2015). No modification indices have been performed (see SEM regression analyzes results in the Table 13).

Table 13. SEM regression analyzes results

Path	<i>B</i>	β	C.R.	R^2	<i>p</i>
Error in EF-->Wisdom	-0.30	-0.43	-1.36	.49	0.18
RT in EF-->Wisdom	0.00	-0.23	-0.96		0.34
income-->Wisdom	0.15	0.23	1.31		0.19
age-->Wisdom	0.06	0.22	1.37		0.17
dummy_sex-->Wisdom	-0.42	-0.28	-1.54		0.13
dummy_mom_ed-->Wisdom	-0.17	-0.16	-0.91		0.37
dummy_dad_ed-->Wisdom	0.32	0.21	1.33		0.19
dummy_live-->Wisdom	-0.64	-0.29	-1.73		0.08

According to the results, model explains the %49 of total wisdom variance. Accordingly, no path in the model is significant.

4. DISCUSSION

According to results of the current study, there was no correlation between age and wisdom measurements. The female participants performed better than males in the BWP. The male participants only reported higher scores than females in the experience dimension of the SAWS. The perception of higher income was positively correlated only with uncertainty performance in the BWP. Those whose mothers were graduated from elementary school scored higher than those whose mothers were graduated from university in the GWR total score. Father's education level did not create any difference. It has been observed that those who have spent most of their lives in metropolis had lower relativism in the BWP compared to those who have spent it mostly in villages and cities. Similarly, those who grew up in towns have a higher tendency for seeking for resolution of the GWR than those who grew up in metropolis.

According to task performance, the participants performed the worst in the GWR and had average performance in the BWP in terms of measures of wisdom. The highest performance was observed in the SAWS. It is also seen that the participants had high performance in the EF tasks.

There was no correlation between EF tasks (inhibition and task switching) and the total score of wisdom measurements (the BWP, the GWR, and the SAWS). However, uncertainty of the BWP was positively correlated with task-switching, and inhibition error in the second go/no-go task (the first one is unrelated) was negatively correlated with the total score of the GWR.

According to SEM results which has a good of fit, there was a moderate correlation between higher-order EF and higher-order wisdom variables which is insignificant

according to covariance analyzes. The variable of higher-order wisdom showed a positive association with the GWR, with the highest loading followed by the BWP, while it showed a negative association with the SAWS. Thus, the results indicate a paradox where individuals who self-report as wise perform poorly on performance measures. Additionally, the variable of higher-order EF is loaded mostly on inhibition, followed by task-switching.

SEM regression analysis had a good fit and almost half of the variance of the higher order wisdom. However, no single variable significantly explained wisdom, which confirms the complex nature of wisdom. Findings suggest that the recognition of many ways situation may unfold sub-dimension of the GWR may be significantly related to EF usage.

4.1. Discussion of Demographic Variables with Wisdom

According to the results of the current study, there is no correlation between age and wisdom. Being older is considered a typical feature of being wise in folk psychology (Grossmann et al., 2010; Heckhausen et al., 1989; Rowley & Slack, 2009; Staudinger, 1999), but research on lay theories of wisdom does not consider chronological age as being crucial for wisdom (Sternberg, 1990). It is known that it takes time to develop wisdom (Baltes & Smith, 1990). As people get older, they gain more life experiences, so it is reasonable to expect them to be wiser in terms of some features of wisdom (Grossmann et al., 2010; Rowley & Slack, 2009; Staudinger, 1999). However, the relationship between age and wisdom is more complicated than it seems (Mickler & Staudinger, 2008; Staudinger, 1999). Accordingly, wisdom is a very complicated structure, and it has different psychological characteristics, such as cognition, equanimity/self-control, metacognition, morals, and self-transcendence (Grossmann et al., 2020). So, some features of wisdom may increase with age while others may decrease (Grossmann et al., 2010; Jason et al., 2001; Mickler & Staudinger, 2008; Staudinger, 1999). For instance, openness to experience, which is a personality

characteristic (McCrae & Costa, 1992), declines with age (Roberts et al., 2003). Also, it is a well-known and replicated finding that aging is related to cognitive decline (Grossmann et al., 2020; Park et al., 2002). Decline in cognitive abilities may result in harder abstract thinking for older adults, which may lead to worse performance in some sorts of wisdom indicators, such as self-relativism (Staudinger, 2008) and fluid intelligence (Staudinger et al., 1990).

Still, even if it is demonstrated that there is zero relation between age and wisdom (Glück et al., 2013; Staudinger et al., 1990), some crystallized wisdom-like features of intelligence such as comprehending an event with a larger context and managing uncertainty might remain stable or even grow with age (Staudinger et al., 1992). As we get older, we may become nicer people with more tolerance (Staudinger et al., 1992) and tend to have more appreciation and concern for the environment (Jason et al., 2001).

Considering that wisdom is often associated with being old (Heckhausen et al., 1989; Rowley & Slack, 2009; Staudinger, 1999), there are few studies that investigate wisdom in children and adolescents (König & Glück, 2012). Studying wisdom with children and adolescents is also important for understanding the development of wisdom (Glück & Bluck, 2013; Sternberg, 2004). From this point of view, this study is important because of its examination of wisdom in an adolescent-young adult context. Considering that younger people have certain advantages in some dimensions of wisdom (Staudinger, 2008), it is reasonable to expand wisdom research to include this sample.

According to the results of the current study, there are gender differences, i.e., the female participants have higher level of total score of BWP and relativism score than the male participants. Also, there are gender differences in experience dimension of the SAWS, with the males reporting more experience. Generally, studies examining gender differences in wisdom have found no relation or a weak relation between these concepts (Aldwin, 2009;

Glück et al., 2009; Orwoll & Achenbaum, 1993). According to Glück et al. (2009), while wisdom in real-life contexts has some gender differences to some extent, abstract conceptions of wisdom have small or no gender differences. Accordingly, while males perform better in cognitive dimensions, females have more advantages in interpersonal dimensions (Aldwin, 2009; Glück et al., 2009; Orwoll & Achenbaum, 1993). In the current study, the participants responded to interpersonal conflict vignette in the BWP, so the female's better performance in the BWP could be explained in this sense. Furthermore, according to the results of the current study, the males performed better in the reaction time of the first go/no-go task, which may also indicate a male advantage in cognitive dimensions.

According to other demographic results, perception of higher income is positively correlated only with uncertainty performance in the BWP. Those whose mothers have graduated from elementary school scored higher than whose mother graduated from university in the GWR total score. However, father's education level did not create any difference. It has been observed that those who have spent most of their lives in metropolis have lower relativism in the BWP compared to those who have spent it mostly in villages and cities. Similarly, those who grew up in towns have a higher tendency for seeking for resolution of the GWR than those who grew up in metropolis. Thus, being disadvantaged in terms of mother's educational level and growing up in a smaller place may be related to the development of some metacognitive skills such as having relativism and the seeking of resolution. This might be consistent with Reed's (2014) theory, which suggests that difficult life events can increase our self-transcendence, which is a feature of wisdom (Grossmann et al., 2020).

4.2. Discussion for Measures of Wisdom

Based on the findings of the current study, the relationship between the BWP and the GWR components indicates a positive trend. Accordingly, the total score of the BWP is positively correlated with the recognition of limits of knowledge; factual knowledge is positively correlated with integration of perspectives; life-span contextualism is positively correlated with the total score of the GWR. There is only one exception that procedural knowledge is negatively correlated with the recognition of the possibility of change. Additionally, the total score of the GWR is negatively correlated with the total score of the SAWS. Also, the sub-dimensions of the GWR and the SAWS are negatively correlated. As a result, both the BWP and the GWR demonstrate a positive trend in their relationship. The SAWS, which is a self-report measure, appears to be unrelated to the BWP. Also, it has been observed that there is a tendency for the SAWS to be negatively correlated with the GWR.

In the current study, the SAWS is a self-report measure in which an individual evaluates his/her own wisdom. The GWR and the BWP are performance measures in which an independent rater evaluates a participant's responses to a situation. In the BWP measurement, the participants produce a response for an event that appears to be hypothetical and independent of them. So, the BWP is a measure of general wisdom is not necessarily related to personal experience and it concerns life in general (Glück et al., 2013). In the GWR, on the other hand, the participants shared their feelings and thoughts about a difficult social life they had recently, so the GWR is more related to personal experience. Also, the SAWS measures personal wisdom (Glück et al., 2013; Grossmann et al., 2010; Mickler & Staudinger, 2008).

When the rater evaluations of the participants' responses are examined, it can be understood that they perform well in terms of the sub-dimensions of the BWP. In particular,

the participants possess good procedural knowledge. However, their responses are quite low in terms of the GWR sub-dimensions. That is, participants are insufficient in terms of the metacognitive strategies presented by the GWR, as (i) they are not sufficiently aware of the limits of their own knowledge, (ii) they are insufficient in recognizing change and the different ways the event can unfold, (iii) they are inadequate in recognizing other perspectives (feelings and thoughts) and cannot positively differentiate them from their own feelings and thoughts, (iv) they are inadequate in integrating different perspectives and initiating compromise, and (v) they put low effort into seeking solutions (Grossmann et al., 2010). Therefore, while the participants exhibit sufficient performance in producing a good response from an external perspective for a given event independent of themselves, which is general wisdom (the BWP), they seem inadequate in utilizing appropriate metacognitive strategies when their own experiences come into play. These findings are supported by the fact that self-distancing has been found to increase wise reasoning (Kross & Grossmann, 2012). In other words, individuals produce wiser responses when they evaluate a situation from a distance, i.e., outside of their own perspective/self (Grossmann, 2017). The high performance for the BWP and the low performance for the GWR in this study can be explained in this context. Therefore, it is important to promote the metacognitive strategies presented in the GWR for young adults who were the sample of the current study.

Additionally, when the responses of the participants regarding the self-report measurement (the SAWS) were examined, it is evident that they tend to evaluate themselves positively. It is known that social desirability is one of the main problems of self-report measurements (Cambaz & Ünal, 2023; Glück et al., 2013). Especially considering the negative correlation between the SAWS and the GWR presented in the current study, it can be understood that those who evaluate themselves as wiser (self-report) show lower levels of wise reasoning in a real-life event. Thus, the suitability of self-reports in measuring

wisdom is debatable. Probably, a 'wise' person who acknowledges their own limitations does not report higher levels of wisdom but rather recognizes the infinite possibilities and appreciates their own humility. But on the other hand, limiting one's wisdom with specific criteria termed as 'performance' measurement also fails to appreciate the complex nature of wisdom. Even the assertion of 'measuring wisdom' using a tool may be problematic. Therefore, paradigms that attempt to understand wisdom provide an outline for this complex notion, such as using metacognitive strategies that indicate wise reasoning (Grossmann et al., 2010) or criteria that highlight expert knowledge in specific areas (Baltes & Smith, 1990). Despite all the obstacles in understanding wisdom, researchers in this field seem to be making significant progress in the science of wisdom (Ardelt, 2004; Glück et al., 2013; Grossmann et al., 2020; Staudinger et al., 1994; Sternberg, 1998).

4.3. Discussion of the Relations between EF and Wisdom

4.3.1. Inhibition and Wisdom

According to the findings of the current study, there is no correlation between inhibition and the BWP, and the SAWS. But inhibition error in the second go/no-go task (the first one is unrelated) is negatively correlated with the total score of the GWR which indicates better inhibition is related with better performance in the GWR. Also, recognition of the limits of knowledge is negatively correlated with the reaction time in the go/no-go task. In the study, the participants demonstrate better performance in the BWP and the SAWS than the GWR. Accordingly, the BWP includes generating responses for external event which is independent of participants, and it is more favorable to generate wise responses, while the SAWS is a self-report measurement and prone to self-desirable reporting (Glück et al., 2013). But, in the GWR (Grossmann et al., 2010), the participants

should generate response about their own experiences, and thus it is more realistic and not lack of context. So, demonstrating wise responses in a measurement that includes self-interest is more challenging (Grossmann, 2017; Kross, & Grossmann, 2012; Santos et al., 2017). Therefore, it is reasonable in this sense that there is a correlation between inhibition and the GWR, but not for the SAWS and the BWP.

Consistent with the results of the current study, Diamond (2013) states that self-control, which is an aspect of inhibitory control, is important for generating wise responses. Self-control encompasses the management of both emotions and actions, including refraining from speaking impulsively, avoiding hasty decisions, practicing intellectual humility by seeking all relevant information before forming conclusions, and striving to offer thoughtful responses rather than instinctual ones. In these aspects, inhibition may be related to wisdom.

4.3.2. Task-Switching and Wisdom

According to the findings, there is no correlation between task-switching and the GWR, the BWP, and the SAWS. However, the uncertainty of the BWP is positively correlated with task-switching, indicating that recognition of uncertainty is related to better performance in mental-set shifting. Contrary to the expectations of the current study, task-switching performance is not correlated with the total scores of the wisdom measurements. This relation is only valid for the uncertainty of the BWP. Similar to the findings of the current study, Dumbravă (2017) could not find a correlation between the computerized task of cognitive flexibility (task-switching) and wisdom. However, unlike the study of Dumbravă (2017), the current study used both performance and self-reported measurements of wisdom, not only self-reported measurements. According to her work, the differences between the two methods of assessment and a smaller sample may have caused this

insignificance. Confirming her suggestion, Cambaz and Ünal (2023) found that when similar measurement methods are used, there may be moderate to high correlations between measures of wisdom and cognitive flexibility. Also, in real-life settings, completely sorting out task-switching and wisdom-related processes from each other is not possible, and the context is important in terms of wisdom and its measurements (Grossmann et al., 2010; Grossmann et al., 2017; Grossmann et al., 2020). Thus, task-switching has been shown to be important for wisdom, albeit only in terms of recognition of uncertainty, even though the current measurements may not adequately reflect real-life conditions.

4.3.3. Discussion for the Covariance Model for EF and Wisdom

To better understand the relationship between wisdom and EF, the current study established a structural equation (covariance) model (SEM) that incorporates different wisdom and EF measurements as a whole. According to this model, there is a moderate correlation (i.e., .43) between higher-order wisdom and higher-order executive function. However, the covariance model shows that this relationship is not significant. According to Miyake and Friedman (2012) common (higher-order) EF is important in maintaining the task goals. This ability provides to keep goal-related information. This information can be used to bias lower-level processing. Specially, inhibition has no diverse variance than common EF, and ability to maintaining the task goals is crucial demand for inhibition (Miyake, & Friedman, 2012; Munakata et al., 2011). Thus, it can be understood that EF, especially inhibition, is important in maintaining wisdom-related goals and information and it is important engagement in wisdom-related lower-level processing.

The model indicates that performance measurements are positively loaded onto the higher-order (meta) wisdom variable, while self-report measurement are negatively loaded.

This finding may suggest, as is similar to the negative correlation between the GWR and the SAWS, that not considering oneself as wise is an indication of wisdom.

Furthermore, there is a correlation coefficient of .92 between the inhibition-based go/no-go task and higher-order executive function, while this coefficient is .35 for task-switching which is consistent with the study of Friedman and Robbins (2022). Accordingly, inhibition has higher level of correlation coefficient on higher-order cognitive control variable than updating and shifting, which are other important EFs in influential taxonomy (Miyake et al., 2000). This may suggest that inhibition is a more important executive function for wisdom. Similarly, while the GWR has a coefficient of .76 in the formation of the higher-order wisdom variable, the BWP has a coefficient of .23. Therefore, it can be understood that, in the sample where this study was conducted, the meta-cognitive strategies in the GWR are important in terms of wisdom.

The BWP task involves looking at a hypothetical event from an external perspective (to examine the effect of distancing on wisdom; Kross & Grossmann, 2012), while the GWR task involves participants writing about a problem they have experienced. Demonstrating wisdom in a process that involves self-focusing and self-interest is more difficult (Grossmann, 2017). Therefore, it can be argued that demonstrating wisdom even in a situation with self-interest explains wisdom in a better way. Specifically, given that narcissism is highest in young adulthood (Weidmann et al., 2023), which is the sample of the current study, it is plausible that there is deficient use of the GWR meta-cognitive strategies in this sample. Thus, the higher correlation coefficient of the GWR to the higher-order wisdom variable can be explained in this way. It can be understood that tasks and studies that focus solely on a specific type of measurement cover only a limited variance of both EF and wisdom. The use of measurement methods that focus on different aspects of wisdom and EF together is important in understanding the relationship between EF and

wisdom. Different types of measurements should be used together in wisdom studies, not only for understanding this relationship but also for a better understanding of wisdom (Cambaz & Ünal, 2023).

4.3.4. Discussion for the Regression Model

Besides, according to SEM regression model, the effect of EF, the reaction time, income, age, sex, mother's education level, father's education level and living place on wisdom performance has examined. The results indicate a good fit of the model, with a large proportion of the overall wisdom variance being explained. However, no single variable was found to significantly account for changes in wisdom alone. Given the complex nature of wisdom (Bluck & Glück, 2005; Grossmann et al., 2020; Sternberg, 2004), it is reasonable to assume that different variables may come together to jointly account for variations in wisdom.

4.3.5. Inhibition Change Depending upon Wisdom Measurements

The current study also examined change in performance and go/no go task performance and which wisdom processes are related to EF changes by measuring inhibition before and after the wisdom measurements. These types of methodology can be used to investigate how certain processes affect working memory processes (Hofmann et al., 2012). Withing-subject design results indicate that inhibition performance did not significantly change between the first and the second go/go task. However, reaction time was better in the second task compared to the first one, suggesting a possible practice effect.

Moreover, based on the reference to the inhibition scores at the beginning of the study, it was observed that participants who consumed the most EFs at the end of the study had

significantly higher scores in the 'recognition of many ways situation may unfold' sub-dimension of the GWR. No significant differences were found for other wisdom sub-dimensions. Therefore, it can be stated that recognizing different ways events can unfold is a situation that requires inhibition.

4.3.6. EF and Wisdom from a Self-regulatory Perspective

From a self-regulatory perspective (Hofmann et al., 2012), the EF skills (the capacity to reach one's goals) are crucial for considering and updating relevant information and perspectives (the standards that are monitored and understood), switching schemas and responses to meet demands as needed (flexibility; Monsell, 2003), having sufficient motivation to reduce the difference between the current situation and the standards, suppressing self-serving responses (inhibition; Miyake et al., 2000), and using all of these abilities to serve the common good and contribute to wisdom (Santos et al., 2017; Sternberg, 1998). When considering self-regulatory processes and the low performance on the GWR task, it appears that some self-regulatory processes are particularly lacking in the current sample.

Models related to wisdom put forth certain metacognitive strategies and standards (Baltes & Smith, 1990; Grossmann et al., 2010). The effective use of these standards and strategies in resolving conflicts in daily life indicates wisdom (Santos et al., 2017). Perhaps, when considering the good performance acquired by participants on the BWP and its sub-dimensions (general wisdom), it can be argued that self-regulatory standards are not low from the perspective of general wisdom (in terms of factual knowledge, procedural knowledge, life-span contextualism, uncertainty, and value-relativism), but rather that monitoring these standards or incorporating GWR-like wisdom-related processes and metacognitive strategies into daily life and self-regulatory processes are lacking. It is

important for individuals to have appropriate standards for a self-regulatory process to be successful. Another important mechanism is having the motivation to reduce the difference between standards and the possible reaction toward a situation. The difference between the GWR and the BWP performance indicates that the participants lack motivation and have a deficiency in inhibiting self-serving responses related to the self-regulation of wisdom processes.

Executive function is an important indicator of sufficient capacity in self-regulatory processes (Hofmann et al., 2012). When considering the current study, the high performance acquired by participants in the EF tasks suggest that they have sufficient capacity for carrying out self-regulatory processes. Inhibiting self-interest, incorporating wisdom-related metacognitive processes, applying mental set switching rules with the required flexibility to lead to wisdom, and displaying appropriate responses are necessary for successful self-regulatory processes (Hofmann et al. 2012; Miyake et al., 2000; Roebbers, 2017). With wisdom as the basis, task-switching can serve to develop a self-regulatory process that diverges from individual and utilitarian goals and tools and serves the "common good" (Sternberg, 1998). Additionally, the issue of how beneficial or detrimental task-switching is in an individual's self-regulatory agenda is influenced by various motivational and cultural factors (Hofmann et al., 2012), and the relationship between self-regulation and task-switching needs further exploration.

Therefore, it is important to understand the role of executive function in wisdom-related processes. EF not only represents the core capacity for self-regulatory processes, but also involves decisions regarding where, whether, and how much to engage functional capacity, which is formalized as the "Expected Value of Control" framework (Munakata & Michaelson, 2021; Shenhav et al., 2013). Therefore, the expected value of the situation is important in making decisions regarding whether to engage EF in a given situation. Thus, in

addition to having the capacity, individuals should also have the motivation to engage their EF. Wisdom holds an important place in guiding all of these processes regarding motivation, standards, capacity, where and how to engage, and in using these processes towards serving the common good.

4.4. Limitations and Future Directions

The performance measures currently in use (the BWP; Baltes, & Smith, 1990; the GWR, Grossmann et al., 2010) and self-report measures (the SAWS; Webster, 2003) have been adapted to Turkish culture through the definitions and paradigms established in Western culture. Qualitative and quantitative studies are needed in Turkey to better understand the concept of wisdom from a psychological perspective. Furthermore, one of the important gaps in the literature is the absence of measurement methods specific to Turkish culture. There are no detailed qualitative-quantitative studies that examine the concept of wisdom within Turkish culture (Ünal, 2021). The use of different types of measurement methods (performance and self-report) created within Turkish culture is important for the understanding of the concept of wisdom in this culture. Moreover, these measurement methods should be examined not only in young adult samples, as in the current study, but also in a broader sample that includes different age groups. Although the global literature is rich in the relation between age and wisdom, the Turkish literature is limited on the issue. Also, previous studies examined the relation between age and wisdom in terms of the general-personal wisdom differentiation (Glück et al., 2013; Staudinger, 2008; Staudinger et al., 2005). The SAWS, Bremen Wisdom Paradigm-like wisdom measurements indicating personal wisdom, and the BWP-like wisdom measurements indicating general wisdom (Glück et al., 2013), must be employed with a larger population that includes a wide range of ages in Turkish culture. Also, the results and the estimates about gender differences

must be done more carefully because there are limited male participants in the study. Future studies may consider homogeneous samples in terms of gender.

In addition, the vignettes and questions used in performance measurement may be inadequate in representing criteria and metacognitive strategies and producing appropriate responses for evaluation. To address this issue, more comprehensive vignettes that include different contexts sensitive to relevant metacognitive strategies/criteria can be developed and implemented in Turkish culture.

The results of the current study revealed that not considering oneself as wise is an indication of wisdom, but further studies are needed to confirm this hypothesis. Especially in the context of the current young-adult sample, participants seem to struggle with accurately estimating their wisdom. Thus, the results call into question the appropriateness of self-report measures for nature of wisdom. Future studies that use self-reports for measuring ‘wisdom’ must be more careful about their estimates. Self-report measurements offer certain advantages, such as their ease of application. However, when it comes to wisdom, the accuracy of the measurement holds greater importance than speed. When considering the limited studies and measures in Turkish culture regarding the science of wisdom, it becomes crucial for researchers to exercise greater caution when drawing conclusions. More complex methods that consider self-deception in the context of wisdom can be developed and implemented for future studies.

Furthermore, the current study has revealed that certain aspects of wisdom may be linked to specific EFs. However, further research incorporating diverse methodologies is required to comprehend how various wisdom processes are associated with EFs. Moreover, using two completely independent types of measurements for examining the relationship between EF and wisdom may be insufficient in understanding the nature of the relationship between these two concepts. There are various modalities utilized in the current study for

measuring EF and wisdom. For instance, participants must use psychomotor abilities in task-switching and go/no go task for responding. But they are using verbal mechanisms in wisdom measures such as phonological loop of working memory. Thus, they are engaging to different types of modalities in their working memory. Therefore, measurement types that examine EF and wisdom in the same context, modality, and measurement technique, including social scenarios and challenging life events, can be developed, and implemented. Besides, there is only one group with pre-post test in within subject design. Future studies may consider using more complex designs, such as a mixed design that includes the addition of a control group.

The findings of this study indicate a significant lack of use of metacognitive strategies that indicate wise reasoning in the young adult sample. For example, the participants do not seem to be sufficiently aware of the limits of their knowledge and are reluctant to take the perspective of others or to resolve conflicts. It appears important to develop intervention programs in terms of metacognitive strategies in the GWR and to teach strategies such as being aware of the limits of their knowledge and considering other perspectives for this young sample to develop wise reasoning. Also, it is important to examine and understand how self-interests hinders self-regulatory processes. Therefore, it is important to develop skills in terms of these strategies. Lastly, it can be understood that it is important to teach individuals wisdom related strategies and standards from an early age so that they possess such strategies. In schools, performance and knowledge-based approaches are emphasized and encouraged. Abilities such as memory and analytical thinking, which are the basis of intelligence, are necessary for school success, but they are not sufficient (Sternberg, 2004; Vasodavan et al., 2021). Wisdom-related skills teach individuals a standard and necessity for their knowledge and skills to serve the common good.

4.5. Conclusions

This study aims to investigate wisdom from a psychological perspective and its relationship with executive function (EF), which has been studied in a very limited way in Turkish culture. The demographic results revealed that females performed better in the BWP, while males reported higher levels of experience in the SAWS. Additionally, having the perception of a good income was related to better performance in uncertainty of the BWP. Furthermore, the results indicated that being disadvantaged, such as growing up in a smaller place or having a lower maternal educational level, may be related to the development of relativism and the seeking of resolution capacities, which is indication of a self-transcendence process.

Results indicate that wisdom is a complex concept and can be better understood by studying it in conjunction with other variables, such as demographic variables, executive function (EF), and so on. Total score in the GWR is related with higher inhibition performance. Also, results indicate a possible relation between higher-order wisdom and higher-order EF variable. Specifically, the results revealed that the use of inhibition (suppression of mindless behavior) may be an indicator of wisdom, even in the context of a computer-based task, which is not directly related to the measurement of wisdom performance. Also, the results show that recognizing different ways events can unfold may be related with the use of inhibition. Also, recognition of uncertainty is related to better performance in task-switching.

The analysis showed that the GWR had the strongest positive association with higher-order wisdom, followed by the BWP. On the other hand, the self-report measurement SAWS had a negative association with higher-order wisdom. Additionally, when looking at the means, the participants generally have low performance in GWR, while they rate themselves

highly in self-report measurement. Thus, results indicates that ones who consider them as less wise in self-report are the ones who has better performance in the GWR measurement. As Wong (2016, p. 1) mentioned “You must be willing to deny yourself in order to serve something greater than yourself.” may be really working.



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6. APPENDICES

APPENDIX A. GROSSMANN'S WISE REASONING MANUEL

(Grossmann'ın Bilgece Muhakemesi Manueeli)

(Grossmann, 2012; Grossmann et al., 2010)

Bağlam: Katılımcıların yakın bir zamanda karşılaştıkları olumsuz bir olaya ilişkin yansıtma ve yanıtlarını değerlendireceksiniz.

Çalışmada katılımcılara son zamanlarda başlarına gelen bir olayı bildirmeleri istenmiştir.

Son zamanlarda yaşadığınız zor bir sosyal yaşantınızı düşünmenizi istiyoruz (örn., anlaşmazlık, tartışma). Bu sizin de içine dahil olduğunuz bir durum olabilir ve tartışmayı siz ya da karşı taraf başlatmış olabilir. Bu olayı betimlemeniz için biraz zaman ayırmanızı istiyoruz. Bir dakikanızı ayırarak bu durumu hatırlamaya ve olayları gözünüzün önüne getirmeye çalışınız. Kimler vardı, neler yaşandı, ne düşündünüz ve nasıl hissettiniz? Bu durumla ilgili bazı sorular soracağız.

-Olay ilk olarak ne zaman başladı?

- ◆ Bu hafta
- ◆ Son bir ay içinde
- ◆ Son 6 ay içinde
- ◆ Son bir yıl içinde
- ◆ 1 yılı aşkın bir süre önce

-Haftanın hangi günüydü?

- ◆ Pazartesi

- ◆ Salı
- ◆ Çarşamba
- ◆ Perşembe
- ◆ Cuma
- ◆ Cumartesi
- ◆ Pazar
- ◆ Hatırlamıyorum

-Günün hangi saatiydi?

- ◆ Sabah
- ◆ Öğleden sonra
- ◆ Akşam
- ◆ Hatırlamıyorum

Olay başladığında neredeydiniz?

Olay başladığında ne yapıyordunuz? (1-2 cümleyle özetleyiniz)

-Karşınızdaki kişinin cinsiyeti neydi?

- ◆ Kadın
- ◆ Erkek

Daha sonra katılımcılardan olay üzerine derinlemesine düşünmesi istendi:

Lütfen olay üstüne derinlemesine düşünürken aklınıza gelen duygu ve düşünceleri detaylandıran birkaç paragrafı aşağıya yazınız. Örneğin, bu duygu ve düşünceler olayın başlamasına, gelişmesine ve çözülmesine ilişkin olabilir.

Değerlendireceğiniz/Kodlayacağınız boyutlar (temalar) şu şekildedir:

I. Bilginin sınırlarının tanınması

II. Değişim olasılığının tanınması/ Olayın açılabilceğı farklı yolların tanınması

III. Anlatıda (farklı) perspektiflerin göz önünde bulundurulması/tanınması

IV. Perspektiflerin/Uzlaşmanın Entegrasyonu

V. Çözüm arayışı

Genel Kodlama Talimatları

1. İlk olarak, sorulara herhangi bir yanıt olmayan (veya “Bilmiyorum”, “fikrim yok” veya saçmalık vs. yazan) kişiler elenmelidir. Böyle olan kişiler için “Dahil etme” sütunu 0 ile işaretlenmelidir (varsayılan değer 1’dir). Bu katılımcılar daha sonraki analizlere dahil edilmeyecektir.
2. Bazı katılımcıların testi ciddiye almadığını düşünüyorsanız, lütfen diğer kısmını işaretleyerek hariç tutma nedeninizi yazınız. Yine de yanıtın geçerli olduğuna karar vermemiz ihtimalini göz önünde bulundurarak yanıtların değerlendirmesini yapınız.
3. Belirli bir boyuttan **açık** bir şekilde bahsedilmesi ile o boyutun **dolaylı/örtülü** şekilde ele alınması arasında ayrım yapmaktayız. Buna göre belirsiz ve boyuttan örtülü bir şekilde bahseden veya boyutun yalnızca bazı bileşenlerini içeren yanıtlar **kısmi** puan alır. Genel olarak, bir yanıtın **derinlemesine puan** alıp alamayacağına karar verirken bir boyutun açıkça söylenmesini (birebir aynı ifadelerle olmayabilir) göz önünde bulundurmanız gerekmektedir.
4. Katılımcıların akıl yürütmelerine rehberlik eden belirli temaları değerlendirdiğimizi unutmayınız. Örneğin, bazı katılımcıların harika fikirleri ve analizleri olabilir – ancak hedeflenen temaların hiçbirini kullanmazlarsa; 0 alırlar. Diğer katılımcılar gerçekleri tamamen yanlış anlayabilir, ancak bilgi eksikliğini kabul edebilir veya farklı perspektifleri göz önünde bulundurursa; bunu yapma derecelerine bağlı olarak 1 veya 2 alırlar.

5. Bazı boyutlar bazı açılardan (örn., bilginin sınırlarının ve değişim olasılığının tanınması; perspektif alma ve perspektif bütünleştirme) birbiriyle örtüşebilir. Bir ifade her ikisinin de göstergelerini içeriyorsa, bunları ikisi için de kodlayınız. İfadenin her bir boyutun kısmi mi yoksa tam durumunu mu gösterdiğine her seferinde dikkat etmeyi unutmayınız.

Ölçek:

- (0) Tema hakkında hiçbir şey söylenmiyor.
- (1) Temanın bir örneğinden bahsedilmiştir, ancak derinlemesine anlatılmamıştır.
- (2) Temanın birkaç örneğinden bahsedilmiştir, ancak hiçbir derinlemesine açıklanmamıştır.
- (3) Temanın bir veya daha fazla örneğinden bahsedilmiştir ve bunlardan biri derinlemesine açıklanmıştır.
- (4) Temanın birkaç örneğinden bahsedilmiştir ve 2+ derinlemesine açıklanmıştır.

Yüzeysel ve Derin İfadelerin Tanımlanması:

Yüzeysel:

- (örnek olarak **Çözüm arayışı** boyutu ele alınırsa) Katılımcılar durumu çözme arzusunu belirtir.
- Katılımcılar, bunu yapmanın önemini kabul eder veya bir çözüm aradıklarını belirtir, ancak nasıl olduğunu belirtmezler.
- Katılımcı, bir çözüme ulaşmanın/çözümü aramanın "olması gerektiğini" göz önünde bulundurur veya dener.
- Katılımcılar örneği kısaca açıklarlar, *ancak detaylandırmazlar*.

Derinlik:

- Katılımcıların bir noktayı detaylandırmasını gerektirir
- Katılımcı, çatışmayı tartışırken gerçekten **bütünsel olarak tema odaklı bir düşünce yapısı sergilemelidir.**
 - *Bütünsel ile*, katılımcının somut, açık örnekler vermesinin yanı sıra, olayın genel bağlamının/anlatım tonunun aradığımız boyut ile eşleştiği bir olay/akış kastedilmektedir.
 - Zıttı durum olarak (örneğin **Çözüm Arayışı** boyutunu ele alırsak), bazı katılımcılar derinlik kriterini karşılayan ayrıntılı bir çözüm önerisi sunabilir ve bunun 4 olarak kodlanması gerekiyor gibi görünebilir, ancak metinlerindeki bağlam/ton küçümseyici olabilir. Örneğin, hayal kırıklıklarına ve şikayetlerine daha fazla odaklanabilirler ve daha sonra sadece isteksizce bir çözüm önerebilirler. Bu da “çözüm odaklı” bir düşünce yapısı olmayacaktır.

Temaya Özel Yönergeler

1- Bilginin Sınırlarının Tanınması (recognition of limits of knowledge)

- Katılımcı, adil bir yargıda bulunmak veya yanıt vermek için belirli bir durum hakkında yeterli bilgiye sahip olmayabileceğini kabul eder.
- Olaya karışan bireylerin belirli bir şekilde davranmasına neden olan faktörler hakkında bilgi sahibi olmayabileceklerini belirtir (yani, karşındakinin bu şekilde davranmalarının bilmedikleri bir sebebi olabileceğinin farkında olur).
- Durum üzerinde düşünürken, katılımcı esasen kendine şüphe avantajı sağlar ve olayın nasıl geliştiğine katkıda bulunmuş olabilecek birçok olası sebep/açıklama bulur.
- Durumu sorgulayan veya belirsizliği ima eden tekrarlanan ifadeler bulunur (örn. “belki, muhtemelen, olabilir” vs.)

- Yeni bilgilerin olayla ilgili algılarını nasıl deęiřtirdięini yansıtmayı da ieren, olayların/atıřmaların yanlış yorumlanması katılımcı tarafından tanınır.

2- Deęiřim Olasılıęının Tanınması/ Olayın Aılabileceęi Farklı Yolların Tanınması
(recognition of the many ways the situation may unfold/recognition of the possibility of change)

- Katılımcı, durumun aılmış/geliřmiř olabileceęi birden fazla alternatif yörünge/yol olduęunu belirtir.
- Olayın geliřebileceęi iki olası yörüngeden ve bunlar arasındaki açık baęlantılardan bahseder. (örn, ifade řu řekilde olabilir: “Bu olabilir, AMA bu alternatif olaylar dizisi de olabilir”)
- Olayın geliřimine bir yörünge belirler ve ardından yol boyunca bařka bir řeyin olabileceęini söyler (örn, ifade řu řekilde olabilir: “Bu olabilir, AMA SONRA bu olabilir”).
- Gelecekteki deęiřim kavramından açıka bahseder veya gelecekte dnyanın deęiřim iinde olacaęı fikrini gündeme getirir.

3- Anlatıda (Farklı) Perspektiflerin Göz Önünde Bulundurulması/Tanınması
(consideration/recognition of different perspectives in the narrative)

- Geçmiřte, řimdi veya gelecekteki olayların dięer tarafta nasıl görülebileceęi ve bunların onları nasıl etkileyebileceęi konusunda aktif olarak dřünür.
- Hem duyguları hem de motivasyonları görmeyi ve bunun arkasındaki mantıęı görmeyi ierir.
- Bu dřüncelerin ardındaki mantıęı ve nasıl ortaya ıktıklarını açıklar.
- Katılımcının olaydaki karakterlerin bakıř aısını almaya alıřan abasını gösterir.

- **Çatışma doğası gereği kişilerarası değilse** (örn. arabanın bozulması, migren ağrısı vb.), bakış açısı edinme, kişinin kendi bakış açısından farklı bir bakış açısına sahip olmasını içerir.

4- Perspektiflerin/Uzlaşmanın Entegrasyonu (integration of perspectives/compromise)

- Farklı bakış açılarını bütünleştirmeyi/entegre etmeyi amaçlar.
- Katılımcı, hangi uzlaşmayı (ödü vererek anlaşmaya varma) veya uzlaşmaları uygulamaya çalıştıklarını, kendisinin veya her iki tarafın ne yapması gerektiğini belirtir.
- Uzlaşmanın beklenen sonucunun nasıl görüneceğinin ayrıntılarından bahseder.
- Böyle bir uzlaşmayı sürdürmenin uygulanabilirliğini/fizibilitesini derinlemesine açıklayabilir.
- **Çatışma doğası gereği sosyal değilse** (örn. arabanın bozulması, migren ağrısı vb.), uzlaşma/bütünleşme, farklı görüşlerin entegrasyonunu ve dengesini içerir.

5- Çözüm Arayışı (search for resolution)

- Katılımcı, sorunu nasıl (geçmişte) çözmeye çalıştıklarını veya bir çözüm bulmanın neden önemli olduğunu vb. belirtir.
- Bu çözümün nasıl görüneceğine/görünebileceğine ilişkin açıklamalarla birlikte örnekler içerir.
- Potansiyel sonuçları yansıtırlar.
- Durumun nasıl/neden çözülmesi gerekliliğinden bahsedilir.
- Bir çözüme ulaşılmasının ne kadar mümkün olduğunu derinlemesine açıklayabilir (eğer bu yol izlenmişse).
- Çözümler, katılımcı tarafından açıklanan mevzubahis çatışma için olmalıdır.

- **Çatışma doğası gereği sosyal değilse** (örn. arabanın bozulması, migren ağrısı vb.), çözüm arama, sorunu çözmenin olası yolları hakkında düşünmeyi içerir (sadece katılımcının sorunu çözmek için yaptıklarını açıklamayı değil).



APPENDIX B. BERLIN WISDOM PARADIGM VIGNETTE AND MANUEL

(Berlin Bilgelik Modeli Örnek Senaryo ve Manuel)

(Baltes & Smith, 1990; Staudinger, 1994)

Lütfen aşağıdaki senaryoya göre soruyu cevaplayınız:

Deniz hanım ve Burak Bey boşanmadan önce 15 yıl evli kaldılar. 10 yaşındaki oğulları Mehmet şimdi hafta içi annesi Deniz Hanım ile, hafta sonu babası Burak Bey ile kalıyor. Burak bey, Deniz hanımdan ayrıldıktan bir yıl sonra yeni biriyle evleniyor. Ancak Mehmet, babasının yeni evlendiği kadından hoşlanmıyor ve artık hafta sonlarını da daha fazla annesiyle geçirmek istiyor. Burak bey bu durum karşısında üzgün ve oğluyla olan bağlantısını tamamen kaybetmekten korkuyor.

Sizce Burak Bey böyle bir durumda neleri göz önünde bulundurmalı ya da ne yapmalıdır? (Lütfen en az 10-15 cümle ile açıklayınız):

1 (İlgili kritere ilişkin düşük skor) - 7 Likert (İlgili kritere ilişkin yüksek skor) ölçeği kullanarak 5 farklı kriter üzerinden katılımcıların yanıtları kodlanmaktadır. İlgili kriterler şu şekildedir (Staudinger et al., 1994).

1. Yaşamın Temel Pragmatikleri Hakkında Zengin Olgusal Bilgi (rich factual knowledge about the fundamental pragmatics of life)

(Problem açıkça geniş bir bağlamda tanımlanmış mı? Sorun kasıtlı ve yapıcı düşünce temelinde farklı perspektiflerden görülüyor mu?)

- Ana karakterin problem açıkça tanımlanmış mıdır? Bu tanımlama metnin basitçe özetlenmesinden ziyade daha geniş bir bağlamda olmalıdır. Bu problemin bütün olarak yaşamla olan ilişkisi gibi.

- Çeşitli temalar ve alternatiflerden bahsediliyor ve sorun sadece bir liste şeklinde değil, kasıtlı ve yapıcı düşünce temelinde farklı perspektiflerden görülüyor.
- Olaylar sadece sayıp dökülmez, ana karakterin ve olaya dahil olan diğer kişilerin güdülleri ve duyguları temelinde tartışılır.
- Kişilerin güdü ve duygularından bahsedilmiş mi?
- Sosyal ağların (toplum, aile) doğası ve insanın ölümlülüğü (hastalık, ölüm) tartışılır.
- Sosyal bağlantıların doğası insanın ölümlülüğü vs. tartışılmış mı?
- İnsan doğasına ve insan varoluşunun koşullarına ilişkin çeşitli temalar ve gözlemler tartışılır: tipik olaylar, belirleyici durumlar ve temel ihtiyaçların karşılanması (örneğin, benlik saygısı, sağlık, sosyal ilişkiler).
- İnsan doğasına ve insan varoluşunun koşullarına ilişkin çeşitli temalar tartışılmış mı?

2. Yaşamın Temel Pragmatikleri Hakkında Zengin Prosedürel Bilgi (rich procedural knowledge about dealing with the fundamental pragmatics of life)

(Problem çözümü için sorular, stratejiler, alternatif seçenekler ve makul senaryolar, geçmiş deneyimler yeniler için zemin oluşturması anlamında değerlendirilir.)

- Bir sorunun önemli yönleri, yaşamdaki zorluklara ve yaşamla ilgili kararlar verme sorunlarına çok fazla düşünüldüğünü gösterecek şekilde tartışılır. (Yani genel olarak bu tip olaylara daha önce kafa yorulmuş gibi bir muhakemeye sahiptir)
- Ana temalara ilişkin spesifik sorular sorulur ve bu soruların cevaplarının problemin çözümü için neden önemli olduğu açıklanır.
- Yaşam soruları hakkında zengin bilgi: seçimler ve karar verme, gelecekteki hedefler ve seçenekler ve bu hedeflere ulaşmak için stratejiler.
- Ana karakter için alternatif seçenekler sunuluyor ve bir veya iki makul senaryo ayrıntılı olarak açıklanıyor.

- Deneyimler sistematize edilir ve değerlendirilir, yeni yaşam perspektifleri için temel oluşturur ve kişinin kendi yaşamını gözden geçirmesini ve başkalarınıninkileri etkiler. Geçmiş olaylar, yeni deneyimler temelinde yeniden değerlendirilir.

3. Yaşam-Boyu Bağlamsalcılık: Yaşam Bağlamlarını ve Zamansal (Gelişimsel) İlişkilerini Anlamak (life-span contextualism: understanding of life contexts and their temporal/developmental relations)

(Geniş bir perspektiften yaşanılanların hayatta nereye oturduğu, sosyo tarihsel bağlam, gerilim çatışmalar, zaman içinde değişimler, önceliklerin belirlenmesi)

- Ana karakterin (eş, aile, arkadaşlar) yaş, tarihsel dönem ve bireysel yaşam durumu ile ilgili önemli sosyal ilişkileri.
- Ana karakterin yaşamı boyunca (geçmiş, şimdi, gelecek), karşılıklı olarak birbirini etkileyen olaylar ve ilişkiler sonucunda zamana bağlı gelişmeler.
- Bir yaşam sorununun sosyo-tarihsel bağlamı.
- Özellikle başkalarının hayatını etkileyen olası gerilimler ve çatışmalar; çeşitli öncelikler ve tavizler tartışılır.
- Kısa ve uzun vadeli çözümler, çeşitli bağlamlar, ilişkiler ve çatışmalar, zamansal bağımlılıkları ve bir yaşam seyri boyunca anlam değişimleri açısından ele alınarak tartışılmaktadır.
- Öncelikler, uzun ve kısa vadeli çözümler için önemlerine bağlı olarak farklı bağlamlarda belirlenir.

4. Değer Göreciliği: Değerler ve Yaşam Hedeflerindeki Farklılıklar Hakkında Bilgi (value-relativism: knowledge about the differences in values and life goals)

(Kişisel olanı soruna ilişkin düşünceden ayırabiliyor mu? O kişinin sahip olduklarına göre çözüm ve değerlendirme yapılır. Tek bir çözüm yoktur, fazladan bilgi gereksiz)

yaklaşımı yoktur. Kişinin değerlerini ve amaçlarını göz önünde bulundurarak değerlendirmelerden en iyisine işaret etmesi. Temelde karşıdaki kişinin değerlerinin, beklentilerinin önemsenmesi.)

- -Kişisel değerlerini, tercihlerini ve deneyimlerini eldeki soruna ilişkin düşüncelerinden ayırabilir.
- Ana karaktere atfedilen kişisel yapıya, değerlere ve güdülere göre çeşitli yaşam hedefleri, çözümler ve değerlendirmeler tanımlar. Soruna yaklaşmanın tek bir çözümü veya tek bir yolu olduğu ve bu nedenle fazladan herhangi bir bilginin gereksiz olacağı izlenimi yoktur.
- -İlgili kişilerin belirli değerlerini ve amaçlarını varsayarak, çeşitli olası çözüm ve değerlendirmelerden nispeten en iyisine işaret eder.
- Kişisel bakış açısına bakılmaksızın, eldeki problemde bahsedilen belirli temel değerlerin geçerliliğini tanır.

5. Belirsizlik: Yaşamın Göreceli Belirsizliği ve Yönetimi Hakkında Bilgi (uncertainty: knowledge about the relative uncertainty of life and its management)

(Risk alınmalı, beklenmedik şeyler olabilir, gereken tüm bilgilere sahip değiliz, belirsizlik ne olursa olsun karar değerlendirme ve plan yapılmalı, belirsizliğin insan için potansiyeli olabilir. Tavsiyeler revize ediliyor mu?)

- Planlar ve kararlar alırken belirli riskler almak gerekir.
- Beklenmedik olaylar çıkabilir ve işler beklenenden farklı gelişebilir. Bu nedenle kararlar sürekli olarak yeniden gözden geçirilmeli ve gerektiğinde geri çevrilme olasılığı da sağlanmalıdır. Kararları gözden geçirirken, başka yorumların da olabileceği göz önünde bulundurulmalıdır. Karar verirken veya değerlendirme yaparken, gerekli tüm bilgilerin mevcut olmadığının farkında olunmalıdır.

- Hayattaki belirsizlikler ne olursa olsun kararlar, deęerlendirmeler ve planlar yapılmalıdır.
- Bu belirsizlik içinde insan için büyük bir potansiyel olabilir.
- Başkalarına tavsiyede bulunurken, bu doğal belirsizlik dikkate alınmalıdır. Bu nedenle, tavsiyeler de her zaman yeniden incelenmeli ve gerekirse revize edilmelidir.



APPENDIX C. SELF-ASSESSED WISDOM SCALE

(Kendine Yönelik Bilgelik Algısı Ölçeği)

(Turgut & Nazlı, 2019)

Aşağıda, insanların kendileri ile ilgili kullandıkları bir grup ifade verilmektedir. Bu ifadeler, insanların yaşam olaylarına bağlı olarak kendilerini nasıl algıladıkları ile ilgilidir. İfadelere katılma düzeyinize göre (1=hiç katılmıyorum, 6=tamamen katılıyorum) yanıt veriniz. Verilen seçenekler arasında doğru ya da yanlış yanıt bulunmamaktadır. Her bir ifade için genellikle nasıl düşündüğünüze işaret eden yanıtı veriniz.

	1	2	3	4	5	6
<i>Hiç katılmıyorum</i>						<i>Tamamen katılıyorum</i>
	1	2	3	4	5	6
1. Hayatımda acı verici birçok olayın üstesinden geldim.						
2. Duygularımı mevcut duruma göre ayarlamak benim için kolaydır.						
3. Sık sık geçmişim ve bugünüm arasındaki bağlantıları düşünürüm.						
4. Kendi şaşkınlıklarına gülebilirim.						
5. Farklı düşünmemi gerektiren kitapları okumaktan hoşlanırım.						
6. Pek çok hayati karar vermek zorunda kaldım.						
7. Sık sık geçmişim hakkında düşünürüm.						
8. Zorlu yaşam şartlarında bile eğlenceli şeyler olabilir.						
9. Sevdiğim müzik türünün yanı sıra farklı müzik çeşitlerini dinlemekten de hoşlanırım.						
10. Yaşamım boyunca çok farklı insanlar ile uğraştım.						
11. Duygularıma uyum sağlarım.						
12. Çok sık hatıralarıma dalarım.						
13. Hayati önem arz eden bir geçiş döneminin üstesinden gelebilmek için mizahi bir yön bulmaya çalışır ve bulurum.						
14. Çok farklı milletlerin yemeklerini tatmayı severim.						
15. Duygu durumumu anlamada çok iyiyimdir.						
16. Geçmişimi gözden geçirmek, güncel sorunlarla ilgili bakış açısı kazanmama yardım eder.						
17. Çok kolay gülerim.						

18. Yaşamın olumsuz taraflarının çoğunu gördüm (örn. sahtekârlık, iki yüzlülük).						
19. Kontrolümü kaybedebileceğim hissine kapılmadan duygularımı özgürce ifade edebilirim.						
20. Ne kadar değiştiğimi görmek için hayatımın erken dönemlerini sık sık hatırlarım.						
	1	2	3	4	5	6
21. Hayatımın bu noktasında yanlışlarıma rahatlıkla gülebiliyorum.						
22. Tartışmalı sanat eserleri toplumda önemli ve değerli bir rol oynar.						
23. Hayatta birçok zorlu dönemeçten geçtim.						
24. İçimdeki gizli duyguları tanımlamada iyiyim.						
25. Geçmiş günlerimi hatırlamak, yaşamdaki önemli sorunlara ilişkin içgörü kazanmama yardımcı olur.						
26. Başkalarını rahatlatmak için mizahı sıklıkla kullanırım.						
27. Görüşleri benimkinden oldukça farklı kişilerle olmayı severim.						
28. Gerektiğinde duygularımı düzenleyebilirim.						
29. Artık hayatın küçük ironilerini anlayabildiğimi düşünüyorum.						
30. Diğer dini ve / veya felsefi inanç sistemleri konusunda çok meraklıyım.						
31. Başkalarından, değerli hayat dersleri öğrendim.						
32. Diğer insanların duygularını okuma yeteneğine sahip olduğum görülüyor.						
33. Geçmiş başarılarımı zihnimde tekrar canlandırmak özgüvenimi artırır.						
34. Başkalarını rahatlatmak için kendimle dalga geçebilirim.						
35. Sık sık hayatı ve onun ötesinde ne olduğunu merak etmişimdir.						

APPENDIX D. TASK-SWITCHING

(Stoet, 2010; Stoet, 2017)

Bu görevde sizden ne yapmanızı bekliyoruz?

Sizi bekleyen ilk görevde ekranda çeşitli harf/sayı (örn., G1) kombinasyonları göreceksiniz.

Bu harf ve sayı kombinasyonuna tuşlar ile yanıt vermelisiniz. Yalnızca iki tuşa ihtiyacınız olacak (B ve N).

Eğer bu harf/sayı kombinasyonu ekranın üst kısmında görünürse, harf kuralına göre,

Eğer bu harf/sayı kombinasyonu ekranın alt kısmında görünürse, sayı kuralına göre yanıt vermeniz gerekecek.

Kuralları görmek için boşluk tuşuna basınız

üst

alt

G6

HARF GÖREVİ

Sessiz G, K, M, R	Sesli A, E, I, U
↓ B 'ye basın	↓ N 'ye basın

SAYI GÖREVİ

Tek 3, 5, 7, 9	Çift 2, 4, 6, 8
↓ B 'ye basın	↓ N 'ye basın

Eğer harf/sayı kombinasyonu üst kısımlarda görünürse, harfe göre yanıt vermelisiniz (bu durumda, "G" harfi, sessiz harf olduğu için «B» tuşuna basınız)

Eğer harf/sayı kombinasyonu alt kısımlarda görünürse, sayıya göre yanıt vermelisiniz

devam etmek için boşluk tuşuna basınız

üst

alt

G6

HARF GÖREVİ

Sessiz G, K, M, R	Sesli A, E, I, U
↓ B 'ye basın	↓ N 'ye basın

SAYI GÖREVİ

Tek 3, 5, 7, 9	Çift 2, 4, 6, 8
↓ B 'ye basın	↓ N 'ye basın

Buna göre bu durumda G harfine göre yanıt veriniz ve 6 sayısını görmezden geliniz. G harfi de sessiz harf olduğuna göre, B tuşuna basınız!

devam etmek için boşluk tuşuna basınız

üst

alt

G4

HARF GÖREVİ

Sessiz G, K, M, R	Sesli A, E, I, U
↓ B 'ye basın	↓ N 'ye basın

SAYI GÖREVİ

Tek 3, 5, 7, 9	Çift 2, 4, 6, 8
↓ B 'ye basın	↓ N 'ye basın

Ve bu durumda, 4 sayısına göre yanıt verin ve G harfini görmezden geliniz. 4 bir çift sayı olduğuna göre N harfine basınız!

devam etmek için boşluk tuşuna basınız

Yalnızca sayı görevinin olduğu bir deneme için hazır mısınız?

tek 3, 5, 7, 9 = **B** bas

çift 2, 4, 6, 8 = **N** bas

devam etmek için space tuşuna basınız

Şimdiyse hem harf görevinin hem de sayı görevinin olduğu bir deneme için hazır mısınız ?

HARF GÖREVİ

Sessiz G, K, M, R	Sesli A, E, I, U
↓ B 'ye basın	↓ N 'ye basın

SAYI GÖREVİ

Tek 3, 5, 7, 9	Çift 2, 4, 6, 8
↓ B 'ye basın	↓ N 'ye basın

devam etmek için boşluk tuşuna basınız

APPENDIX E. GO/NO-GO TASK

(Stoet, 2010; Stoet, 2017)

The diagram is set against a black background. It features a central yellow rectangular area. At the top of this area, the text 'Gelecek olan görevde, yalnızca bu mesajı gördüğünüzde boşluk tuşuna basınız' is written in black. Below this, there is a light green oval containing the text 'GİT' and 'Boşluk tuşuna basınız' in black. Further down, the text 'Bu mesajı (Gitme) gördüğünüzde ise hiçbir şey yapmayınız' is written in black. Below this, there is a light red oval containing the text 'GİTME' and 'Hiçbir şeye basmayınız' in black. At the bottom of the yellow area, the text 'Şimdi, başlamak için boşluk tuşuna basınız!' is written in black. In the bottom left corner of the black background, there is a small white icon of a square with a circle inside.

Gelecek olan görevde, yalnızca bu mesajı
gördüğünüzde boşluk tuşuna basınız

GİT
Boşluk tuşuna basınız

Bu mesajı (Gitme) gördüğünüzde ise hiçbir şey
yapmayınız

GİTME
Hiçbir şeye basmayınız

Şimdi, başlamak için boşluk tuşuna basınız!

APPENDIX F. DEMOGRAPHIC FORM

Kaç yaşındasınız?

- Yaşınızı yazınız:

Cinsiyetiniz:

- Erkek

- Kadın

Annenizin en son mezun olduğu okul:

- İlkokul

- Ortaokul

- Lise

- Üniversite

Babanızın en son mezun olduğu okul:

- İlkokul

- Ortaokul

- Lise

- Üniversite

Yaşamınızın büyük bir bölümünü nerede geçirdiniz?

- Köy

- İlçe/Kasaba

- Şehir

- B y k      

Gelir d zeyinizi nasıl tanımlarsınız?

- Ya  grubuma g re T rkiye ortalamasının  ok altında

- Ya  grubuma g re T rkiye ortalamasının altında

- Ya  grubuma g re T rkiye ortalamasında

- Ya  grubuma g re T rkiye ortalamasının  st nde

- Ya  grubuma g re T rkiye ortalamasının  ok  st nde



APPENDIX G. ETHICAL APPROVAL FORM

**ANKARA YILDIRIM BEYAZIT ÜNİVERSİTESİ (AYBÜ)**
SOSYAL VE BEŞERİ BİLİMLER ETİK KURULU
PROJE ONAY BELGESİ

Ankara Yıldırım Beyazıt Üniversitesi İnsan ve Toplum Bilimleri Fakültesi/Enstitüsü Psikoloji bölümü akademisyenlerinden / öğrencilerinden Hüseyin Zahid Cambaz'ın, "Bilgelik ve yürütücü işlevler arasındaki ilişkinin incelenmesi" adlı araştırması değerlendirilmiştir. *(Bu kısım başvuru sahibi tarafından doldurulmalıdır)*

Proje etik açısından uygun bulunmuştur. ☒

Proje etik açısından geliştirilmesi gerekmektedir. ☐

Proje etik açısından uygun bulunmamıştır. ☐

AYBÜ SOSYAL VE BEŞERİ BİLİMLER ETİK KURULU KARARI (Etik Kurul tarafından doldurulacaktır)	
Araştırma kodu (Yıl – Araştırma sıra no)	2021-610
Başvuru formunun Etik Kurula ulaştığı tarih	30.12.2021
Etik Kurul Karar toplantı tarihi ve karar no	06.01.2022-36
Yer	Yıldırım Beyazıt Üniversitesi, Esenboğa Külliyesi
Katılımcılar	Formda imzası bulunan üyelerimiz toplantıya katılmıştır.

KURUL BAŞKANI VE ÜYELER:

	İMZA
Prof. Dr. Hakkı ODABAŞ	Başkan
Prof. Dr. Mehmet Ali ZENGİN	Üye
Doç. Dr. Behlül TOKUR	Üye
Doç. Dr. Özge GÖKBULUT ÖZDEMİR	Üye
Doç. Dr. Ali POLAT	Üye
Doç. Dr. Musa ÖZTÜRK	Üye
Dr. Öğr. Üyesi Semih CEYHAN	Üye
Dr. Öğr. Üyesi Recep YORULMAZ	Üye
Dr. Öğr. Üyesi Ömer ASLAN	Üye
Dr. Öğr. Üyesi Keziban Büşra KAYNAK EKİCİ	Üye
Dr. Öğr. Üyesi Gülay YAZICI	Üye

8

APPENDIX H. CONSENT FORM

Bu çalışma Arş. Gör. Hüseyin Zahid Cambaz tarafından yüksek lisans tezi kapsamında ve Dr. Öğretim Üyesi Gülten Ünal danışmanlığında yürütülmektedir. Bu çalışmada belirli akıl yürütme stratejileri ile yürütücü işlevler arasındaki ilişki incelenmektedir. Bunun için çalışmada sizlerden belirli görevleri tamamlamanız istenmektedir. Çalışma yaklaşık 20-25 dakika sürmektedir.

Bu çalışmaya katılmak tamamen **gönüllülük** esasına dayanmaktadır. Çalışmaya **katılmama** veya katıldıktan sonra herhangi bir anda çalışmayı bırakma hakkına sahiptir. Çalışmadaki soruları yanıtlarken kimsenin baskısı veya telkini altında olmayın. Bu çalışmadan elde edilecek bilgiler tamamen araştırma amacı ile kullanılacaktır. Çalışmada sizi fizyolojik/psikolojik olarak olumsuz etkileyecek bir durum bulunmamaktadır.

Çalışmaya devam etmeniz, araştırmaya katılım için onam verdiğiniz biçiminde yorumlanacaktır.

✓ Çalışmaya katılmayı kabul ediyorum

(ÖNEMLİ: BU ÇALIŞMAYI BİLGİSAYAR VE KLAVYE İLE GERÇEKLEŞTİRMENİZ GEREKMEKTEDİR. LÜTFEN DEVAM ETMEDEN ÖNCE YORGUN OLMADIĞINIZA, DİKKATİNİZİN DAĞINIK OLMAMASINA DİKKAT EDİNİZ VE SESSİZ BİR ORTAMA GEÇİNİZ.)

APPENDIX I. TABLE 9

Table 9. Correlations among variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.Age	1														
2.Income	.056	1													
3.Task-switching total error	.076	-.011	1												
4.Task-switching total RT	.061	-.040	.239**	1											
5.Go/no go total error	-.010	-.038	.192*	-.058	1										
6.Go/no go total RT	-.041	.027	.051	.316**	-.233**	1									
7. BWP total	.060	.156	-.013	.018	-.066	.000	1								
8.Factual knowledge	-.033	.073	.023	.052	-.056	.018	.685**	1							
9.Procedural knowledge	.017	.009	-.070	.090	-.106	.085	.555**	.206*	1						
10.Life-span contextualism	.096	.104	.045	-.001	.030	-.111	.622**	.301**	.045	1					
11.Relativism	.048	.075	.002	-.005	-.018	.025	.652**	.239**	.336**	.249**	1				
12.Uncertainty	.066	.246**	-.058	-.075	-.079	.000	.737**	.436**	.319**	.340**	.326**	1			
13.GWR total	-.009	.022	-.083	-.025	-.135	-.142	.129	.106	-.038	.190*	.059	.080	1		
14.Recognition of Limits of Knowledge	-.065	-.024	-.029	.022	-.039	-.202*	.164*	.030	.016	.324**	-.010	.150	.542**	1	
15.Recognition of Possibility of Change	-.005	.102	-.012	-.044	-.037	.088	-.018	.003	-.199*	.128	-.025	.004	.556**	.158	1
16.Consideration Perspectives	.017	-.015	-.051	.050	-.072	-.121	.064	.067	.019	.088	-.024	.051	.671**	.297**	.206*
17.Integration of Perspectives/Compromise	.043	.046	-.100	-.097	-.134	-.131	.133	.164*	.011	.057	.114	.078	.703**	.122	.226**
18.Search for Resolution	-.033	-.031	-.064	-.016	-.133	-.076	.070	.070	.033	.026	.124	-.028	.680**	.174*	.203*
19.SAWS total	-.026	.108	-.054	-.017	.074	-.040	-.051	-.057	-.019	-.025	-.054	-.009	-.192*	-.034	-.100
20.Emotion regulation	.042	.085	-.088	-.127	.063	-.030	-.032	-.130	.019	-.002	-.020	.041	-.097	-.033	-.001
21.Reflection	-.116	.088	-.078	.025	-.006	.043	.064	.054	.114	-.038	.041	.052	-.103	-.009	-.043
22.Experience	.137	.042	.101	.069	.079	-.038	-.082	-.069	-.032	-.002	-.086	-.081	-.271**	-.117	-.195*
23.Humor	-.157	.053	-.063	.010	.006	.089	-.083	-.055	-.180*	-.018	-.032	.002	-.010	.049	.036
24.Openness	.003	.091	-.044	-.020	.108	-.194*	-.050	.011	-.005	-.024	-.093	-.053	-.165*	-.001	-.137

Table 9. Correlations among variables (more)

	16	17	18	19	20	21	22	23	24
16.Consideration Perspectives	1								
17.Integration of Perspectives/Compromise	.331**	1							
18.Search for Resolution	.281**	.475**	1						
19.SAWS total	-.174*	-.167*	-.118	1					
20.Emotion regulation	-.168*	-.026	-.066	.704**	1				
21.Reflection	-.154	-.132	.013	.593**	.236**	1			
22.Experience	-.183*	-.152	-.202*	.700**	.368**	.235**	1		
23.Humor	.007	-.087	-.021	.711**	.406**	.296**	.398**	1	
24.Openness	-.073	-.172*	-.128	.656**	.311**	.196*	.385**	.335**	1

* $p < .05$, ** $p < .01$

APPENDIX J. TABLE 10

Table 10. Group differences for mother's educational level

<i>df</i> (3,145)	Primary school (N =45)		Elementary school (N =32)		High School (N =46)		University (N =26)			
Variables	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>F</i>	<i>p</i>
Task-switching										
Total error	6.62	5.22	7.75	4.38	5.24	4.05	9.35	9.27	3.19	0.03*
Total response time	3417.98	593.87	3337.79	536.52	3293.89	560.20	3036.25	573.04	2.56	0.06
First go/no go task										
Reaction time	452.87	63.90	429.62	69.56	435.74	73.14	422.55	75.97	1.26	0.29
Total error	1.00	1.30	2.00	1.70	1.20	1.19	1.46	1.17	3.78	0.01*
Second go/no go task										
Reaction time	430.84	74.71	398.78	53.74	429.84	79.37	414.44	87.51	1.48	0.22
Total error	1.20	1.10	1.38	1.24	1.30	1.31	1.69	1.35	0.90	0.44
Wisdom-Berlin Wisdom Paradigm										
Factual knowledge	4.07	1.48	3.69	1.49	4.57	1.46	4.23	1.21	2.47	0.06
Procedural knowledge	4.62	1.23	4.47	1.29	4.83	1.27	4.62	1.13	0.55	0.65
Life-span contextualism	3.76	1.54	4.00	1.67	4.22	1.46	3.85	1.26	0.79	0.50
Relativism	3.93	1.16	3.94	1.44	4.20	1.44	3.65	1.32	0.94	0.42
Uncertainty	3.93	1.23	3.94	1.46	4.20	1.24	4.19	1.39	0.48	0.69
BWP total	20.31	4.31	20.03	4.90	22.00	4.16	20.54	4.44	1.67	0.18
Wisdom-Grossmann's Wise Reasoning										
Recognition of Limits of Knowledge	0.84	0.64	1.03	1.00	0.85	0.84	0.77	0.71	0.59	0.62
Many Ways Situation May Unfold	0.87	0.79	0.88	0.79	0.78	0.73	0.73	0.87	0.25	0.86
Perspectives in the Narrative	1.22	0.77	1.56	1.08	1.07	0.68	1.00	0.69	3.12	0.03*
Integration of Perspectives	1.00	0.88	1.34	0.87	1.02	0.98	0.85	0.78	1.67	0.18
Search for Resolution	0.93	0.81	1.19	0.86	0.87	0.78	0.65	0.69	2.27	0.08
GWR total	4.89	2.14	6.00	3.45	4.59	2.31	4.00	2.23	3.32	0.02*
Self-Assessed Wisdom Scale										
Emotion regulation	31.89	6.21	32.81	6.51	31.30	6.59	33.92	6.11	1.06	0.37
Reflection	30.56	6.11	27.63	6.18	31.13	6.69	31.58	4.19	2.80	0.04*
Experience	24.51	5.62	24.72	6.85	25.76	5.40	26.00	4.53	0.62	0.60
Humor	31.02	5.28	29.38	6.21	30.30	5.62	30.54	4.50	0.58	0.63
Openness	29.29	5.68	29.38	5.79	30.37	6.21	31.50	5.13	1.00	0.40
SAWS total	147.27	18.78	143.91	21.96	148.87	21.49	153.54	14.44	1.19	0.32

APPENDIX K. TABLE 11

Table 11. Group differences for father's educational level

<i>df</i> (3,145)	Primary school (N =17)		Elementary school (N =33)		High School (N =37)		University (N =62)			
Variables	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>F</i>	<i>p</i>
Task-switching										
Total error	6.53	4.27	7.00	4.35	5.03	3.92	8.10	7.37	2.24	0.09
Total response time	3484.17	593.64	3352.12	586.98	3243.51	370.93	3245.47	661.22	0.97	0.41
First go/no go task										
Reaction time	464.42	44.68	434.04	81.32	441.22	75.30	429.26	66.29	1.18	0.32
Total error	1.24	1.64	1.42	1.23	1.59	1.61	1.21	1.24	0.67	0.57
Second go/no go task										
Reaction time	417.82	39.45	418.18	86.19	430.38	89.15	417.25	67.94	0.26	0.85
Total error	1.18	1.01	1.42	1.46	1.22	1.18	1.45	1.22	0.43	0.73
Wisdom-Berlin Wisdom Paradigm										
Factual knowledge	4.41	1.33	3.94	1.43	4.35	1.57	4.11	1.44	0.65	0.58
Procedural knowledge	5.00	1.37	4.67	1.29	4.46	1.22	4.66	1.19	0.75	0.53
Life-span contextualism	4.06	1.25	4.12	1.73	3.70	1.60	4.02	1.37	0.54	0.65
Relativism	4.18	1.13	4.21	1.29	3.84	1.54	3.85	1.29	0.76	0.52
Uncertainty	4.29	1.26	4.21	1.34	4.00	1.33	3.95	1.30	0.49	0.69
BWP total	21.94	4.16	21.15	4.73	20.35	4.83	20.60	4.16	0.61	0.61
Wisdom-Grossmann's Wise Reasoning										
Recognition of Limits of Knowledge	0.59	0.71	1.00	0.97	0.92	0.83	0.85	0.70	1.05	0.37
Many Ways Situation May Unfold	0.53	0.62	0.91	0.80	1.00	0.82	0.74	0.77	1.82	0.15
Perspectives in the Narrative	1.06	0.83	1.45	0.83	1.08	0.76	1.19	0.85	1.48	0.22
Integration of Perspectives/Compromise	1.00	0.71	1.15	1.00	1.00	0.82	1.05	0.95	0.19	0.90
Search for Resolution	1.12	0.78	1.00	0.90	0.84	0.83	0.87	0.74	0.66	0.58
GWR total	4.35	1.06	5.52	3.21	4.84	2.51	4.71	2.58	0.98	0.40
Self-Assessed Wisdom Scale										
Emotion regulation	31.00	6.34	32.61	6.12	33.46	6.76	31.71	6.32	0.84	0.47
Reflection	31.06	6.49	30.27	5.51	31.30	6.59	29.47	6.12	0.79	0.50
Experience	24.59	6.72	25.79	5.67	24.97	5.93	25.19	5.27	0.20	0.89
Humor	29.47	5.65	30.55	5.50	31.14	6.20	30.05	4.95	0.48	0.70
Openness	27.53	6.30	30.39	6.53	29.78	6.09	30.66	4.92	1.38	0.25
SAWS total	143.65	22.23	149.61	21.82	150.65	21.11	147.08	17.15	0.61	0.61

APPENDIX L. TABLE 12

Table 12. Group differences for living place

<i>df</i> (3,145)	Village (N =7)		Town (N =21)		City (N =34)		Metropolis (N =87)			
Variables	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>F</i>	<i>p</i>
Task-switching										
Total error	6.71	4.07	6.57	5.30	7.00	5.38	6.98	6.26	0.03	0.99
Total response time	3224.47	563.94	3481.55	535.61	3326.95	567.90	3244.59	590.06	1.02	0.38
First go/no go task										
Reaction time	405.22	76.09	489.16	71.17	422.45	67.81	433.17	65.84	5.32	0.00*
Total error	1.14	1.46	1.48	1.50	1.18	1.45	1.41	1.33	0.35	0.79
Second go/no go task										
Reaction time	398.45	66.73	456.97	93.71	429.04	79.54	410.62	66.60	2.58	0.06
Total error	1.00	1.15	1.14	1.20	1.03	1.00	1.56	1.32	2.03	0.11
Wisdom-Berlin Wisdom Paradigm										
Factual knowledge	3.43	1.81	4.33	1.49	4.32	1.45	4.13	1.42	0.84	0.47
Procedural knowledge	4.86	0.90	4.62	1.20	5.09	1.26	4.47	1.23	2.15	0.10
Life-span contextualism	3.29	1.60	3.76	1.67	4.21	1.53	3.98	1.43	0.91	0.44
Relativism	3.71	1.38	4.48	1.03	4.53	1.21	3.64	1.36	5.20	0.00*
Uncertainty	3.86	0.90	4.10	1.22	4.18	1.31	4.02	1.36	0.17	0.92
BWP total	19.14	4.98	21.29	3.65	22.32	4.70	20.24	4.38	2.25	0.08
Wisdom-Grossmann's Wise Reasoning										
Recognition of Limits of Knowledge	0.71	0.76	0.67	0.73	0.94	0.78	0.91	0.83	0.69	0.56
Many Ways Situation May Unfold	0.71	0.49	1.00	0.55	0.74	0.79	0.82	0.84	0.54	0.65
Consideration/Perspectives in the Narrative	1.14	0.69	1.33	0.97	1.09	0.79	1.23	0.82	0.43	0.73
Integration of Perspectives/Compromise	0.86	0.38	1.14	1.06	1.06	0.85	1.05	0.91	0.18	0.91
Search for Resolution	0.57	0.79	1.38	0.80	0.97	0.67	0.82	0.81	3.45	0.02*
GWR total	4.14	1.35	5.52	2.52	4.79	2.24	4.82	2.82	0.64	0.59
Self-Assessed Wisdom Scale										
Emotion regulation	30.57	4.54	32.05	6.36	32.00	6.30	32.55	6.61	0.25	0.86
Reflection	31.71	5.68	29.95	7.34	29.91	6.12	30.39	5.96	0.19	0.90
Experience	28.71	5.12	24.95	6.02	25.38	6.13	24.91	5.41	1.00	0.39
Humor	31.00	3.46	31.24	5.82	29.24	6.11	30.54	5.23	0.72	0.54
Openness	31.86	4.49	28.76	6.80	32.12	5.93	29.37	5.39	2.50	0.06
SAWS total	153.86	12.09	146.95	24.22	148.65	23.45	147.76	17.66	0.23	0.87