A SCALE DEVELOPMENT FOR SOCIAL AND EMOTIONAL LEARNING SKILLS OF MIDDLE SCHOOL CHILDREN

by

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ABSTRACT

A SCALE DEVELOPMENT FOR SOCIAL AND EMOTIONAL LEARNING SKILLS OF MIDDLE SCHOOL CHILDREN

The purpose of the current study is to develop a self-reported social emotional learning (SEL) skills scale based on the Taxonomy Project designed by the Ecological Approaches to Social Emotional Learning (EASEL) Laboratory of the Harvard Graduate School of Education. The scale is planned to include 5 of these major dimensions and 56 items for the analysis. A group of 5 students was interviewed prior to administering the study to determine the length of time and the clarity of the scale. Then, the scale is further tested by confirmatory factor analysis (CFA) with a sample of the 893 5th and 6th graders (10-12 years) from different public schools. Once the proper CFA results are obtained, item response theory (IRT) is utilized to assess item performance in the SEL assessment tool, providing a more profound insight into the measured construct. In brief, to create greater precision and transparency in the field, the current study developed a standardized common SEL skills scale in line with SEL framework provided as an outcome of the Taxonomy Project.

ÖZET

ORTAOKUL ÖĞRENCİLERİNİN SOSYAL DUYGUSAL ÖĞRENME BECERİLERİNE YÖNELİK ÖLÇEK GELİŞTİRME

Bu çalışmanın amacı, Harvard Lisansüstü Eğitim Okulu'nun Ekolojik Yaklaşımlarla Sosyal Duygusal Öğrenme (EYSDÖ) Laboratuvarı tarafından tasarlanan Taksonomi Projesi'ne dayalı bir sosyal duygusal öğrenme (SDÖ) becerileri ölçeği geliştirmektir. Ölçek, bu projenin bir çıktısı olan SEL çerçevesinin 6 ana boyutundan 5 tanesini ve analiz için 56 maddeyi içerecek şekilde planlanmıştır. Çalışmayı uygulamadan önce, ölçeğin süresini ve açıklığını belirlemek için 5 öğrenciden oluşan bir grupla görüşmeler yapılmıştır. Ardından, ölçek farklı devlet okullarından gelen 893 5. ve 6. sınıf öğrencisine (10-12 yaş) uygulanmış ve çıktılar doğrulayıcı faktör analizi (DFA) ile analiz edilmiştir. Uygun DFA sonuçları elde edildiğinde, ölçüm aracındaki madde performansını değerlendirmek için madde tepki teorisi (MTK) kullanılıp, bu da ölçülen yapı hakkında daha derin bir anlayış sunmuştur. Özetle, mevcut çalışma, Taksonomi Projesi'nin sonucu olarak sunulan SEL çerçevesi ile uyumlu standart ve kapsayıcı bir SEL becerileri ölçeği geliştirmek yoluyla, alanda diğer araştırmalarda kullanılmak üzere bir ölçek ortaya koymuştur.

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a	Discrimination parameter
b	Difficulty parameter
df	Degrees of freedom
X^2	Chi-square

LIST OF ACRONYMS/ABBREVIATIONS

1PLM	1-Parameter Logistic Model
2PLM	2-Parameter Logistic Model
3PLM	3-Parameter Logistic Model
ASCD	Association for Supervision and Curriculum Development
CASEL	Collaborative for Academic, Social and Emotional Learning
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CSDP	Comer School Development Program
CTT	Classical Test Theory
DESSA	The Devereux Student Strengths Assessment
EASEL	Ecological Approaches to Social Emotional Learning
EASEL LAB	Ecological Approaches to Social Emotional Learning Lab.
EFA	Exploratory Factor Analysis
EI	Emotional Intelligence
ERC	The Emotion Regulation Checklist
GPCM	Generalized Partial Credit Model
GRM	Graded Response Model
ICT	Item Characteristic Curve
IRT	Item Response Theory
MEIS	Multifactor Emotional Intelligence Scale
MI	Multiple Intelligences
ML	Maximum Likelihood
OECD	Organization for Economic Cooperation and Development
RMSEA	The Root Mean Square Error Of Approximation
SDÖB	Social Skills Evaluation Scale
SDQ	Strengths and Difficul-Ties Questionnaire
SE	Social Emotional
SEAM	The Social-Emotional Assessment/Evaluation Measure

SEL	Social Emotional Learning
SELS	Social Emotional Learning Scale
SELSS	The Social Emotional Learning Skills Scale
TLI	Tucker-Lewis Index
WLS	Weighted Least Squares

1. INTRODUCTION

The first chapter provides the background, significance, purpose and research question of the study.

1.1. Background of the Study

There is a tremendous upheaval on the awareness of the importance of social emotional learning (SEL) skills all over the world (Weissberg *et al.*, 2015). Similarly, to demonstrate this rise, McKown (2017) calls SEL a "hot topic". One of the main reasons behind this upward slope is that educators and parents have a great passion for directing young people to become included in social groups around them, avoid risky acts, attain decent outcomes in their lives, improve how to think properly and be motivated to lead a proactive life (Payton *et al.*, 2000). Although most education policy makers, academicians and teachers had similar conclusions in their studies regarding the significance of SEL skills, there are some ambiguous points mostly depending on definitions, categorization and related assessment tools for the concept of SEL (Frey *et al.*, 2019).

SEL skills, sometimes referred to as non-cognitive skills, soft skills, or 21st-century skills, encompass a range of abilities related to emotional intelligence, interpersonal communication, and personal well-being (Elias *et al.*, 1997). The term "non-cognitive" refers to skills that are not directly related to academic content or cognitive abilities but are seen as essential for academic and personal success (Hendricks Institute, n.d.). Different organizations and researchers have developed their own frameworks and taxonomies for SEL skills, resulting in a range of terms and definitions. For example, the Organization for Economic Cooperation and Development (OECD) has identified seven broad categories of "global competencies" that include SEL skills such as self-awareness, empathy, and collaboration (OECD, 2018). Despite these variations in terminology and categorization, there is a growing recognition of the importance

of developing SEL skills among students, and efforts to create a unified taxonomy or framework for these skills are underway.

According to Berg and colleagues (2017), there are 136 SEL programs and within those programs, they identified 748 competencies. However, many schools and organizations have developed their own frameworks or adapted existing ones to fit their specific needs, which can make it challenging to provide an exact number of frameworks. Although most of those are similar and intersect in certain respects, they range considerably in terms of their goal, extent, organization, level of detail required, and the length to which they address concerns of development, context, and cultural value. They differ in which skills they highlight and the terminology they choose depending on their specific purpose, objectives, and learning resources. As this heterogeneity has enhanced research and practice, it has also confused the thumb knowledge on the subject.

Since there has not been a certain framework and there was a lack of unity across academics, professionals, and legislators on which traits are crucial, whatever they're named, and if and how they are linked to one another (Jones *et al.*, 2016), having a common assessment tool has been a challenging issue for years (Zins *et al.*, 2004). Durlak and colleagues (2011) argue that certain core or "essential" components, such as self-awareness, self-management, social awareness, and relationship skills, are consistently included across various SEL programs, while Dusenbury and colleagues (2015) suggest that programs that focus on a smaller number of core or "foundational" skills, such as self-awareness, self-management, and social awareness, may be more effective than those that attempt to target a large number of specific skills. Regarding, the Taxonomy Project is designed by The Ecological Approaches to Social Emotional Learning (EASEL) Laboratory of the Harvard Graduate School of Education to build a coherent taxonomy of non-cognitive skills that classifies, identifies, and links them across domains in a brand-agnostic and context-sensitive manner (Jones, 2019). As one of the main outcomes of the project, "Explore SEL" website (http://exploresel.gse.harvard.edu/) with tools for comparing the "words" or labels

for various skills in the many frameworks has been created (Jones *et al.*, 2019) and this paved a way for a compiled framework with marshaled definitions from various frameworks.

Although this project breathed into the SEL field in terms of creating a common framework with clear definitions of the certain terms, the lack of unity on the assessment tools of the SEL concept maintains. While Shoenert-Reichl and colleagues (2009) pointed out the lack of standardized assessment tools available for evaluating factors affecting children's social and emotional wellbeing, significant progress has been made in the development of such tools since then. For instance, the Collaborative for Academic, Social, and Emotional Learning (CASEL) has created a framework for assessing five core competencies of SEL and offers a suite of assessments that have been validated for use in educational settings (Dusenbury *et al.*, 2015). Similarly, the Assessment Work Group of the National Commission on Social, Emotional, and Academic Development has recommended a set of common metrics for evaluating SEL programs and policies (Jones and Kahn, 2017). However, despite these advances, there is still a need for improved and widely-accepted measures that comprehensively evaluate SEL skills across diverse populations and settings. While some assessments may focus on specific skills or domains, there is a lack of consensus on the most critical SEL skills and how they should be assessed. Furthermore, many of the available assessments have not undergone rigorous validation and reliability testing, which limits their utility in accurately measuring SEL. Therefore, it is crucial to continue research efforts to develop valid and reliable assessments that comprehensively evaluate SEL skills and promote effective SEL programming. While there was not a consensus on the terms and related definitions, it was an inevitable consequence not to have a common framework on the field. However, assessment tools that are produced based on theories (identified concepts) of SEL frameworks will result in valid outcomes in research. Therefore, since the framework provided by the Taxonomy project summed up the definitions and enabled a universal SEL framework, this current study focuses on developing a common assessment tool of SEL based on this entire framework and assess children's SEL skills using this tool.

1.2. Significance of the Study

The current study aims to develop a SEL assessment tool based on the common framework of SEL provided as an outcome of the Taxonomy Project by the EASEL Laboratory of the Harvard Graduate School of Education. The current study is significant:

(i) It provides a coherent assessment tool which compiles and links the key frameworks and expertise in the field of research.
(ii) It supports schools in determining the proper SEL program for their organizations because they will have the chance of defining the insufficient SEL skills of their students and their current programs' strengths.

Educators require accurate and valid measurements of social and emotional skills to effectively implement SEL programs in their classrooms. Without these measurements, it is difficult to identify specific areas of improvement for their students and to assess the effectiveness of the program as a whole. For example, a study by Sklad and colleagues (2012) found that a lack of valid and reliable measurement tools hindered the implementation of effective SEL interventions in schools. Similarly, Durlak and Weissberg (2011) emphasized the importance of using evidence-based SEL assessments to evaluate the impact of SEL programs on student outcomes. Consequently, having a coherent and effective assessment tool for SEL is crucial as it enables educators to accurately measure these skills and make informed decisions about their programs. Thus, the current study aims to contribute to the field by providing a comprehensive assessment tool which compiles and links the key frameworks and expertise in the field of research.

Second issue is assisting schools with accurate data for designing appropriate SEL programs. Durlak and colleagues (2011) declared that currently, most schools do not use evidence-based preventative strategies. When the issue is to choose a math program, most of the schools are spending noticeable time and effort to decide the

most effective program (Knoff, 2018a, 2018b); however, it is not the same for selecting a SEL program. Blyth (2018) proposes that school teams should select a framework that respond to their needs so that they will have data to demonstrate outcomes if schools require a framework to communicate with stakeholders, to obtain buy-in, or to decide which specific competencies and abilities to develop. In order to assist schools in defining in which SEL skills cannot accomplish as expected and designing a strong SEL program in relation to this data, a universal SEL assessment tool is a must. It is clear that this planned assessment tool can support schools in determining the proper SEL program for their organizations.

All in all, while there are various SEL assessment tools available, the lack of unity and universality in these tools has led to challenges for researchers, educators, and policymakers in designing and evaluating effective SEL programs. To address this issue, the current study aims to contribute to the field by providing a coherent and standardized assessment tool for SEL skills, based on a universally recognized SEL framework.

1.3. Purpose of the Study

The purpose of the study is to develop a standardized assessment tool in line with the SEL framework provided as an outcome of the Taxonomy Project by the EASEL Laboratory of the Harvard Graduate School of Education.

1.4. Research Question

The research questions of the study: How can a standardized assessment tool be developed in line with the SEL framework provided by the EASEL Laboratory?

2. LITERATURE REVIEW

2.1. A Brief History of the Social Emotional Learning (SEL) Concept

Prior to the 20th century, the idea of SEL was virtually nonexistent. It was only in the 20th century that the importance of it began to be recognized although it was not directly called as SEL concept. Despite numerous attempts at naming and defining SEL, there has never been a consensus on an umbrella term or definition. Some of the titles given to the idea and collection of abilities that make up it include character education, personality, skills for the twenty-first century, soft skills, and noncognitive talents. Various theorists used very similar (although not quite the same) definitions for distinct terms such as Emotional Intelligence (Goleman, 1994) and Multiple Intelligences (Gardner, 1993), though the phenomena that they were referring to could be the same for all.

Plato's work called *The Republic* may be considered as one of the earliest roots of social emotional learning dating back as 380 B.C. (Edutopia, 2011). Some scholars like Lane (2013) argued that Plato firmly emphasized importance of a holistic approach in education through the expression:

> Maintaining a sound system of education and upbringing you produce citizens of good character; and citizens of sound character, with the advantage of a good education, produce in turn children better than themselves and better able to produce still better children in their turn...(Lane, 2013; Plato, 2016, p. 424)

Although the roots of the term SEL can be attributed to the date back 380 B.C., modern attempts related to education in schools can begin to be inspected by the 20th century. Producing good citizens through schooling has always been the idea, and SEL has gained more attention as an important educational concept in recent decades.

In 1960, Comer School Development Program (CSDP) was conducted with a strong belief in the idea that several intense values resulting from interactions between

adults and children while they are growing up are the cornerstones for their development (Comer, 2013). To create this interaction, CSDP focused on involving different stakeholders of current communities rather than just school principals or teachers. This program was one of the oldest attempts which had the notion of SEL approach.

After a while around 1992, some educators and scholars started to work on social development and social competence programs. Weissberg and Shriver created the K-12 New Haven Social Development program together with some educators (Weissberg *et al.*, 1997). In a parallel time with this attempt around 1992, the W.T. Grant Consortium on the School-Based Promotion of Social Competence (1992) is built for better communities who care about prevention of harmful behaviors like drug addiction. Relatedly, this consortium shared a guideline for SEL inclusion in schools. This guideline involved several distinct skills such as fostering resilience, self-efficacy and positive identity (Catalano *et al.*, 1998).

One of the other well-known contributions to SEL was in 1994. A great number of educators and scholars are brought together by the Fetzer Institute to share ideas and generate new common wisdom for supporting children for a productive society (CASEL, 2018). Thanks to this gathering, the social and emotional learning term is embodied through the organization called Collaborative for Academic, Social and Emotional Learning (CASEL). Starting from this step, CASEL has been a superior institution which endeavors to expand the term SEL all over the United States. The main purpose of CASEL is to enable every child to have well-constructed and synthesized academic, social and emotional learning in schools through decent programs which have roots in evidence-based research. After a while, CASEL and Association for Supervision and Curriculum Development (ASCD) were assembled, and they introduced a framework which focuses on children's necessities. As things go, this cooperation paved a way for an inclusive strategies guidance list through the book named as Promoting Social and Emotional Learning: Guidelines for Educators (Elias *et al.*, 1997).

With funding from the Fetzer Institute and the Surdna Foundation, CASEL was founded in 1994 to improve research on the social and emotional abilities that contribute to student performance in academic and social life (CASEL, 2018). The aim of CASEL is to enable "evidence-based social and emotional learning an integral part of education from preschool through high school" (CASEL, 2003). CASEL's leadership group of researchers and experts started with Berman, Caesar, Elias, Goleman, Greenberg, Growald, Haynes, Jackson, Lantieri, Long, Manning, O'Brien, Patti, Pickeral, Shriver, Sluyter, Walberg, Weissberg, and Zins (CASEL, 2018; Durlak *et al.*, 2011) outlined social and emotional learning and proposed a framework of social and emotional abilities that transfer further in social and emotional learning standards. The SEL principles act as a "blueprint" for SEL education; those set particular objectives and criteria for students across grade level and specify what students should actually be able to perform (CASEL, 2018). Standards can also influence the selection of evidence-based programs and the development of SEL-related professional learning (Weissberg *et al.*, 2015). Standards can also guide the choice of evidence-based programs and the development of SEL-related teacher education (Weissberg *et al.*, 2015). SEL standards differ from test scores in that they do not require evaluation or accountability. It might be beneficial to consider them as learning objectives or competencies rather than standards" (CASEL, 2018). In 2004, the Illinois State Board of Education developed a SEL framework containing learning standards and benchmarks for kindergarten through 12th grade, making Illinois the first state in the USA to do so (Illinois State Board of Education, 2004). They amended their framework in 2013 to include preschool, and currently all preschools in the United States have SEL criteria (Weissberg *et al.*, 2015). The three SEL goals in Illinois are as follows: to develop self-awareness and self-management skills for academic and life success; 2) use social-awareness and interpersonal skills to establish and maintain positive relationships; and 3) demonstrate decision-making skills and responsible behaviors in personal, school, and community contexts (Zinsser, 2015). These SEL criteria and abilities have started to affect instructional methods in certain schools, leading in significant, beneficial results for students.

2.1.1. The Concept of SEL

In simple terms, social and emotional learning involves recognizing and controlling emotions, fixing problems productively, and creating meaningful relationships with others - competences that are certainly important for all students (Durlak *et al.*, 2011, p. 407). SEL therefore aims to change a variety of behaviors, perceptions, and emotions (Joseph *et al.*, 2007). Due to the lack of a single measurement tool based on a universal framework, establishing a clear framework and associated assessment tools has become a challenging task. The existence of numerous definitions for this concept further complicates the matter although we have lots of commons within that variety.

The Collaborative for Academic, Social and Emotional Learning, an Advocacy Group (CASEL) spreads SEL in the way that is most well understood. It explains SEL as:

> "...the process through which children and adults acquire and effectively apply the knowledge, attitudes, and skills necessary to understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relation- ships, and make responsible decisions", (CASEL, 2018, para. 1.).

Even though the mostly applied one is the CASEL's definition, another example is McKown (2017)'s one as:

> "...the thinking, behavioral, and self-control skills that are applied in social interactions and that in hence children's social and other life outcomes", (McKown, 2017, p. 161).

Similarly, the other definition of SEL is:

> "...the process through which individuals learn and apply a set of social, emotional, behavioral, and character skills required to succeed in schooling, the workplace, relationships, and citizenship", (Jones *et al.* 2017, p. 12).

In conclusion, even though there is no single measurement tool based on a universal framework, some widely acknowledged assessment tools linked to specific frameworks and the perspectives of researchers can serve as fundamental measurement statements and definitions. Similarly, competencies such as recognizing and regulating emotions, effective problem-solving, and developing meaningful relationships with others are commonly viewed as crucial elements that define the concept of SEL and therefore provide a robust foundation for establishing a universal measurement tool.

2.1.2. The Need for SEL Concept in Education

SEL warrants serious, persistent attention throughout K–12 schooling since it is essential to students' long-term performance in and out of the classroom (Bridgeland *et al.*, 2013; DePaoli *et al.*, 2017; Weissberg *et al.*, 2015). Five fundamental clusters of social and emotional competences have been identified by Roger Weissberg and colleagues (2015): self-awareness, self-management, social awareness, interpersonal skills, and ethical decision-making. These skills are believed to help pupils achieve academically and socially throughout their time in school, to decrease problematic behaviors and mental distress, and to better prepare them for success in college, the workforce, families, and society (Elias, 2014; Jones and Kahn, 2017).

As a respectively fresh update on the data from four sizable meta-analyses, Mahoney and colleagues (2018) examined the effects of social and emotional learning (SEL) programs for all students in public schools on student outcomes. They looked at 356 study publications on various SEL programs that involved thousands of K–12 pupils from both inside and outside the United States and the results were not different than as in the past. These reports all had strong procedures and performance data either post- or follow-up from these students. The studies show that comprehensive school based SEL programs have a favorable impact on involved pupils' performance in a wide range of crucial behavioral and academic results that are noticeable right away after the completion of the intervention and continue during several follow-up periods.

Ultimately, there is a compelling argument that SEL has significant positive effects on individuals, both in terms of short-term gains in positive attitudes and long-term benefits in terms of improved behavior, academic achievement, and mental health (Mahoney *et al.*, 2018). Consequently, the necessity of SEL programs is an indisputable fact.

2.1.3. The Relationship Between SEL Skills and Academic Performance

In recent years, the incorporation of SEL skills within educational environments, particularly in science and mathematics education, has gained considerable prominence owing to its potential to influence cognitive and academic aptitudes. SEL's dedicated approach to nurturing emotional intelligence, interpersonal proficiencies, and responsible decision-making among students becomes particularly relevant in the context of academic learning. This section of the thesis delves into the compelling evidence that substantiates the positive correlation between SEL and enhanced performance in science and mathematics education. By investigating the transformative effects of SEL in these specific domains, this thesis also aims to underscore the vital importance of integrating SEL initiatives into curricula to facilitate comprehensive student development and improve academic outcomes.

Both parents and educators widely agree that focusing solely on teaching reading, writing, and mathematics is insufficient to prepare children for their future roles as professionals, leaders, and responsible global citizens (Cohen, 2006; Public Agenda, 2002). Greenberg *et al.* (2003) propose a broader mission for 21st-century schools, emphasizing the need to educate students not only in academic subjects but also in developing qualities such as responsibility, compassion, maturity, and social competence.

Recognizing the importance of SEL skills within the school environment, Elias and Haynes (2008) argue that being well-versed in social and emotional understanding empowers students to cultivate positive relationships in the classroom and effectively manage their emotions, leading to increased focus on academic learning. Conversely,

Blum and Libbey (2004) suggest that early adolescents who lack SEL skills may face difficulties in their interactions with teachers and peers, resulting in decreased classroom engagement and ultimately affecting their academic performance negatively.

Numerous studies provide empirical evidence supporting the crucial role of social and emotional foundations in academic success (Greenberg *et al.*, 2003; Hawkins *et al.*, 2008; Jones *et al.*, 2011; Zins *et al.*, 2004). Failure to develop these skills can lead to various personal, social, and academic challenges (Durlak *et al.*, 2011; Malecki and Elliot, 2002; Weissberg and Greenberg, 1998; Welsh *et al.*, 2001; Wentzel, 1991b). For instance, Wentzel (1991a) found that socially responsible behaviors positively correlated with academic achievement, while problem behaviors negatively impacted academic performance in middle school students. Similarly, research by Malecki and Elliot (2002) revealed that problem behaviors at the beginning of the school year were associated with lower academic achievement, whereas social-emotional skills positively predicted both concurrent and end-of-year academic performance.

Support for the significance of SEL skills in academic success also comes from intervention research with programs designed to teach these skills in schools. A meta-analysis of school based SEL programs demonstrated that participation in these programs significantly improved students' social, emotional, and academic competencies (Durlak *et al.*, 2011). Students who took part in SEL programs exhibited enhanced social and emotional skills, more positive attitudes, and improved behavior, leading to an 11%-point increase in academic achievement. These positive effects remained stable for up to six months after completing the SEL programs. Moreover, respectively recent research also underscores the critical role of social and emotional competence in fostering positive academic development (Taylor and Dymnicki, 2007). Evidence from various studies investigating the relationship between social and academic development, as well as evaluations of school-based interventions, supports the idea that social and emotional aspects are foundational for academic growth (Caprara *et al.*, 2000; Gil-Olarte Marquez *et al.*, 2006; Seider *et al.*, 2013).

Apart from the arguments supporting the positive impact of SEL skills on academic performance in general, there is a considerable body of research specifically focusing on math and science education, which highlights the beneficial influence of SEL skills on students' performance in these subjects. For instance, research conducted by Durlak *et al.* (2011) revealed that students who were exposed to SEL instruction performed notably better in mathematics when compared to those who did not receive such instruction. Additionally, a separate investigation by Schenke *et al.* (2019) showcased that students who displayed increased levels of self-regulation and social awareness also achieved higher results in math. These discoveries underscore the significance of SEL in fostering success in mathematics.

Another prominent example of such research is conducted by Haynes and colleagues (2003). In this book, the authors present a comprehensive overview of factors believed to contribute to academic challenges, particularly among disadvantaged urban students, including issues like low expectations and the effectiveness of teachers. To address these challenges, the authors outline a series of reforms that were implemented in the district. These reforms included aligning instruction with the curriculum and assessments, integrating technology into the learning process, making the content more meaningful to students, and inviting retired scientists and engineers to serve as role models and sources of information. The results of a study conducted to evaluate the impact of these reforms showed that schools that conformed more closely to the proposed changes witnessed greater gains in math test scores among students compared to schools with less adherence to the reforms. Moreover, the authors argue that for effective math and science learning, the problems and concepts taught must hold personal meaning and relevance for students. Hence, they emphasize the need for teachers to personalize lessons and engage students with real-life applications of math and science concepts. For instance, some classrooms that incorporated activities where students were encouraged to create their own math word problems showed positive responses from students, displaying genuine interest and engagement in the subject matter.

Moreover, student achievement in math depends on several factors, like teachers' knowledge, teaching methods that support kids' social and emotional development, good classroom management, and high-quality teaching (Ottmar, Rimm-Kaufman, Larsen, and Berry, 2015). When these factors work together, learning math becomes easier and clearer. Teachers can create a positive and supportive classroom atmosphere by using SEL strategies in math class (Jennings and Greenberg, 2009). This helps students feel more comfortable sharing ideas, taking risks, and engaging in hands-on learning (Ottmar, Rimm-Kaufman, Larsen, and Berry, 2015).

In addition to the discussed research, it is worth noting that there are numerous other theoretical perspectives and related research on social and emotional development that bear relevance and significance in the math and science education context. Furthermore, adolescents' concerns regarding social acceptance, awareness of social hierarchies, and their attention to impression management are crucial elements in their developmental journey. Understanding the implications of these beliefs and competencies for instruction is essential for educators in science and mathematics, as well as other subjects, to support students' overall growth and academic success.

2.2. Assessment Tools for SEL

2.2.1. A Review of Assessment Methods in SEL

Thanks to the modeling efforts of cognitive theorists in the 20th century, conceptual clutter of SEL began to clear up and all these definitions and terms were compiled under social emotional intelligence with the awareness of that it is an essential part of personal accomplishment (Gardner, 1993; Zimmerman *et al.*, 1992), thus being referred to as that.

The concept of emotional intelligence (EI) was first introduced by Salovey and Mayer in 1990 as a mixed embodiment of social and emotional intelligences. They argued that social and emotional competencies were important in predicting success

in life and suggested that EI could be assessed through specific skills (Salovey and Mayer, 1990). Salovey and Mayer also argued that emotions themselves are a form of intelligence, as they serve an adaptive function in individuals' lives, helping them to navigate social situations and make effective decisions (Salovey and Mayer, 1990). In 1999, Mayer, Caruso, and Salovey further developed the concept of EI by defining it as an intelligence that involves the ability to perceive, understand, and regulate emotions in oneself and others (Mayer *et al.*, 1999).

Following, Howard Gardner proposed his theory of Multiple Intelligences (MI) in 1993, which included interpersonal and intrapersonal intelligences as two of the eight intelligences. Gardner argued that these intelligences were critical to our ability to understand and navigate the social world and our own emotions (Gardner, 1993). This theory demonstrated that the measurement method for social-emotional orientation could be very much alike the intelligence assessments. Thanks to these common threads, the Multifactor Emotional Intelligence Scale (MEIS) formed by Mayer and colleagues (1999) has been one of the prior assessment attempts for social-emotional orientation. Scholars like Caruso and colleagues (2002) and Roberts and colleagues (2001) examined the testing method to a great extent. The structure was not altered; however, what they advocated was that the structure did not alter from any other areas of intelligence through the discriminant validity tests. That is, the operationalization of the emotional intelligence concept was not successful (Ciarrochi *et al.*, 2000). Moreover, some scholars argued that the main reason for this mismatch was related with current definitions in intelligence theory. They argued that assessment of SEL differs in its nature which is affected from several sociocultural contexts than assessment of intelligence which mostly has a strict accurate result (Brody, 2004; Roberts *et al.*, 2001).

When the complementary relation between what Salovey and Mayer (1990) suggested regarding social emotional orientation and Mayer's (1999). Multifactor Emotional Intelligence Scale (MEIS) is considered, measurement attempts for SEL are evaluated similar to the measurement of intelligence. In contrast to this assumption,

some theorists asserted that social emotional understanding is a personality trait rather than being a fundamental factor raised by intelligence (Bar-On, 1997). Respectively, the measurement tool, based on MEIS, designed by Schutte and colleagues' (1998) is verified as the one that focuses more on personality traits than intelligence (Davies *et al.*, 1998). This discussion on whether social emotional understanding is related with personality traits triggered researchers to examine the issue from distinct points of view. Mayer and colleagues (1999) also modified their former work to demonstrate this required distinction and they tended to determine the discriminant validity between a common personality test and MEIS (Caruso *et al.*, 2002).

Subsequent to the initial introduction of EI and MI, scholars began working on operationalizing the concept of Social-Emotional Learning (SEL). In 2002, Caruso, Mayer, and Salovey identified four main components of SEL: identifying emotions, using emotions, understanding emotions, and managing emotions (Caruso *et al.*, 2002). These components have been used to develop and assess SEL programs in schools and other settings.

Overall, the historical order of these concepts suggests that the development of the concept of EI was followed by the proposal of MI and then the operationalization of SEL; however, it is important to note that these concepts are interrelated and have influenced each other over time. Several scholars have attempted to operationalize SEL as a personality trait or intelligence, resulting in a variety of definitions and assessment tools (Mayer *et al.*, 2008; Schutte *et al.*, 1998; Elias *et al.*, 1997).

Although there are some assessment tools focused on the overall SEL skills, the common way for the practitioners was to design a proper instrument for each specific situation that they are faced with. This reality resulted in the point that there currently are satisfying numbers of tools that focus on specific sub-dimensions of social emotional learning like verbal expression (Kring *et al.*, 1994).

Some of these tools have also been used specifically in Turkey, where the sample for this research is based. These tools can help educators and researchers better understand students' social and emotional competencies, as well as identify areas where further development may be needed.

Given the diverse range of assessment tools available and their potential for enhancing SEL competencies in educational contexts, a thorough examination of these tools would be beneficial for both practitioners and researchers. Therefore, it is essential to inspect these tools in the scope of literature review.

2.2.2. A Review of Assessment Methods in SEL

There are six major methods of assessment tools associated with social emotional skills which are behavioral observation, behavior rating scales, interviewing, self-report instruments, projective–expressive techniques, and sociometric techniques. While each SEL assessment tool has its own advantages and disadvantages, their selection should be based on factors such as the age of the children being assessed (as young children may not be able to participate in self-reporting) and the intended purpose of the SEL program (such as developing attitudes, perceptions, knowledge, or behaviors) (Merrel, 1999).

(i) Projective-Expressive Techniques

Projective-expressive techniques mainly about applying to specific ways like drawing, puppet applications or story completion for giving the opportunity to the child for expressing himself/herself. It may be considered as an assessment method with too little evidence for defining and classifying specific SEL skills.

(ii) Self-Report Instruments

Self-report instruments, which primarily comprise factual psychometric measures that compare children' replies to those of a normative group on clusters of self-report items, are becoming more and more useful for assessing internalizing issues like depression and anxiety, self-concept, and general personality development.

Since there has not been much research done to show how well self-report evaluation works in the domain of social skills assessment, self-report assessment of children's SEL skills should be considered as an experimental method (Merrel, 2001).

(iii) Sociometric Assessment Techniques

In the field of child development, sociometric assessment methods including peer nomination, peer rating, peer ranking, and alternative processes have an extended and rich history. Sociometric techniques have been shown to have very significant concentrations of validity and reliability and may be effective social outcome indicators in the future (e.g., McConnell and Odom, 1986). However, there are two substantial limitations of this technique. One of them is about social skills. Despite the clear link between social skills and peer acceptance, it is commonly accepted that these procedures only test peer acceptance or social reputation and not social skills (Landau and Milich, 1990). Another one is about its practicality. Instead of being done individually, sociometric assessments are carried out in social groups, such as schools.

Due to worries that some students would experience greater feelings of rejection as a result of taking the assessment, it is generally acknowledged that securing parental and administrative authorization to perform sociometric assessments in schools is highly challenging.

(iv) Interviewing

The earliest and also most frequent social-emotional assessment technique is probably interviewing. It is sufficient to execute interviews in a variety of ways, from using highly planned interview schedules to doing unstructured, "stream of consciousness" interviews. Interviews can be conducted with the children and young people being assessed directly, as well as with the children's parents and teachers.

(v) Behavioral Observation

Elliott and Gresham (1987) stated that "analyzing children's behavior in natural settings ... is the most ecologically valid method of assessing children's social skills" (p. 96). Naturalistic direct behavioral observation has traditionally been the go-to evaluation technique for practitioners and researchers who are be-

haviorally oriented, therefore it stands to reason that the study of behavior in naturalistic settings must strongly rely on it.

(vi) Behavior Rating Scales

One of the most common ways to assess children's behavior today is through behavior rating scales, and new discoveries in this field keep building on earlier successes. Behavior rating scales have had a significant influence in recent years and have accumulated an outstanding body of supported empirical data in the assessment of social skills (and social behavior in general) of children and adolescents (Merrell and Gimpel, 1998).

Since there are questions about how directly and accurately the first two approaches-projective-expressive methods and self-report tools- tap the relevant construct, they should not be applied frequently for measuring children's social skills, especially for children under the age of 8. The use of sociometric approaches and interviews may be highly beneficial for measuring children's social skills in specific contexts, but these methods have intrinsic pragmatic issues that restrict how widely they should be applied for this purpose. On the other hand, the rational endpoint for most of the cases is that direct behavioral observation and self-report assessment for SEL skills. Following, the current study is planned to develop a self-report assessment tool as a Likert type.

2.2.3. A Review of Currently Used SEL Measurement Tools Applied Worldwide

It is crucial to review currently used SEL assessment and measurement tools applied worldwide, while aiming to develop a standardized SEL assessment tool. In this part, some of the most applied tools are briefly explained.

The Devereux Student Strengths Assessment (DESSA) is one widely used SEL assessment tool developed by the Devereux Center for Resilient Children. The DESSA measures eight core social-emotional competencies, including self-awareness, self- management, social awareness, relationship skills, goal-directed behavior, personal respon-

sibility, decision-making, and optimistic thinking. It is suitable for students in grades K-8 and has been used in several countries, including the United States, Canada, and Australia (Devereux Center for Resilient Children, 2021).

The Social-Emotional Assessment/Evaluation Measure (SEAM) is a tool developed by the University of Minnesota to assess social-emotional competencies in preschool children. The SEAM measures five core competencies: emotion regulation, social competence, empathy, self-awareness, and self-management. It is suitable for children aged 3-5 and has been used in various countries, including the United States, the United Kingdom, and China (University of Minnesota, 2021).

One other commonly used SEL assessment tool is the Strengths and Difficulties Questionnaire (SDQ), developed by the University of London. The SDQ is a brief behavioral screening questionnaire that measures emotional symptoms, conduct problems, hyperactivity/inattention, peer relationships, and pro-social behavior. It is suitable for students aged 4-17 and has been used in several countries, including the United Kingdom, Canada, and Australia (University of London, 2021).

The Emotion Regulation Checklist (ERC) is a tool developed by Shields and Cicchetti (1997) to assess emotion regulation in children and adolescents. The ERC measures various aspects of emotion regulation, including emotion lability, emotion regulation strategies, and emotional reactivity. It is suitable for children aged 6-18 and has been used in various countries, including the United States, Canada, and Japan (Shields and Cicchetti, 1997).

To sum up, different assessment and measurement tools for social and emotional competencies have been used globally to evaluate students' skills according to various SEL frameworks. These tools can be helpful for educators and researchers to pinpoint strengths and weaknesses in students' social and emotional abilities, as well as develop interventions to enhance them.

2.2.4. A Review of Currently Used SEL Measurement Tools Applied in Turkey

SEL has become an increasingly important aspect of education in Turkey, with many educators and researchers recognizing the value of assessing and measuring students' social and emotional competencies. As a result, several assessment and measurement tools have been developed and used to measure various aspects of SEL across different age groups also in Turkish schools. Inspecting mostly applied SEL assessment and measurement tools in Turkey plays a pivotal role for our study also because the data is going to be collected in Istanbul/Turkey. In this part, some of the most applied tools in Turkey are briefly explained.

One of the well-known SEL assessment tools in Turkey is The Social Emotional Learning Skills Scale (SELSS) developed by Kabakçı and Owen in 2010 specifically for the evaluation of 6th and 8th grade students' SEL skills (Kabakçı and Owen, 2010). SEL skills are associated with four skill group categories (Korkut, 2004) as problem solving skills, communication skills, self-esteem enhancing skills, and coping with stress skills. SELSS is a Likert type scale consisting of 40 statements and developed by applying construct validity, exploratory factor analyses and confirmatory factor analyses.

Social Emotional Learning Scale (SELS) (Coryn et. al, 2009) is another SEL assessment tool adapted in Turkish language by Arslan and Akın (2003). Following the confirmatory factor analyses of the tool for the Turkish language version, validity of the adapted version is found as the same to the original version of it. Similarly, the Social Skills Evaluation Scale (7-12 years old) (SDBÖ) is adapted by Akçamete and Avcıoğlu (2005) to Turkish language. It is another likert type scale for assessment and measurement of SEL skills.

Overall, these assessment and measurement tools are valuable resources for educators and researchers in Turkey to gain insights into students' social and emotional competencies and identify areas for further development. However, it is important to

consider cultural and linguistic factors when applying these tools in different contexts while generating a standardized assessment tool. For instance, one of the statements contains the term 'I language,' which may prove challenging for some 10-year-old students to grasp. Consequently, this factor should be taken into careful consideration during the planning stages.

2.3. Frameworks and the Taxonomy Project

As theory of change (e.g., Ghate, 2018; Weiss, 1995) states a framework, in the social sciences, may be described as a structuring system, a blueprint, or even a map that guides the user what to await for. A framework, in principle, is a tool that paves a way for structuring related ideas to provide a basis for reasoning, expressing, and acting (Berg *et al.*, 2019).

Within the concept of SEL, this mainly relates to the kind of knowledge, skills, and attitudes that one may anticipate seeing in children, adolescents, and adults, as well as when they might be predicted to emerge and become apparent during development (Blythe *et al.*, 2018). SEL frameworks are fundamental means of organizing and identifying social-emotional competencies, their interconnections, and components of the social and emotional learning process and configurations in aim of assisting attempts to learn, communicate, and collaborate to develop such competencies. Those are the basic building blocks of a framework, and they possess knowledge, attitudes, and skills that individuals need to be socially and emotionally capable and achieve in school, work, and life (Berg *et al.*, 2019).

Since SEL frameworks encapsulate ways of understanding and prioritizing that shape fundamental and practical research, as well as associated policies and practices, they have a greater load and impact in the field. The frameworks are frequently used to drive an institution, program, or approach to the domain as one of the most prevalent means of communication about and structuring extracurricular skills. Thus, frameworks have a significant impact on how skills are emphasized, treated, and measured

in both practice and research (Burrus *et al.*, 2022). By carefully examining frameworks, gaining additional insight into how various stakeholders in the international area perceive and define skills is probable.

Berg and colleagues (2017) defined 136 Social Emotional (SE) competence structures which are associated with 14 different areas of study such as character, culture, positive youth development, school-based competency development and workforce. Although these structures range considerably in terms of their goal, extent, organization, level of detail required, and the length to which they address concerns of development, context, and cultural value, most of them are similar and intersect in certain respects. For example, 10 of these structures are categorized under the character education area. One of the 10 prominent is The Tripartite Taxonomy of Character organizes competencies based on whether they are interpersonal, intrapersonal, or intellectual in nature. Likewise, the Character Lab structure also sorts the main competencies into three groups of character strengths as strengths of heart, strengths of mind, and strengths of will (Character Lab, 2017). Moreover, they differ in which skills they highlight and the terminology they choose depending on their specific purpose, objectives, and learning resources. While this heterogeneity has enhanced research and practice, it has also confused the thumb knowledge on the subject.

2.3.1. A Brief Overview of the EASEL Taxonomy Project

The topic of SEL is loaded with jingle-jangle misconceptions; there is a lack of unity across academics, professionals, and legislators on which traits are crucial, whatever they're named, and if and how they are linked to one another (Jones, *et al.*, 2016). Although there have been a great number of research design attempts to prevent this lack, the Taxonomy Project designed by The Ecological Approaches to Social Emotional Learning (EASEL). Laboratory of the Harvard Graduate School of Education is one of the best research projects of the SEL field. The main goal of the Taxonomy project is to build a coherent taxonomy of non-cognitive skills that classifies, identifies, and links them across domains in a brand-agnostic and context-sensitive

manner (Jones, 2019). Correspondingly, the overarching purpose of the project is to define and link the many frameworks such as CASEL, Character Lab, and OECD and terms in the field. By doing that, the study aims to improve clarity and transparency, as well as to enable more effective translation among research, practice, and policy.

In an attempt to display how non-cognitive notions are connected to one another across disciplines as well as when and how evidence proves them, the project utilizes a strict coding system to map frameworks and concepts onto one another. The system is built to protect each framework's integrity while without obfuscating subtleties in meaning or links to supportive evidence. It tracks if or when the numerous competencies defined in each framework, from the total number of 40, overlap with 550+ widespread social, emotional, and associated skills spread throughout 23 sub-domains and 6 major domains. Based on how many overlapping codes each term-pair got, their similarity is also computed. To make sure that the coding system accurately and completely captures the domain, it is currently being tested and improved by research- and practice-based experts.

Furthermore, as a result of this study, the website Explore SEL was created. It serves as a guide for anyone researching social and emotional learning. To encourage openness and well-informed decision-making, it offers data and resources that compile and link the key frameworks and expertise in the industry.

In this project, the process of creating a taxonomy is attributed to 5 main steps as selecting initial set of frameworks to code, collecting general information about each framework, coding the frameworks, creating interactive tools for navigating coded frameworks, and sharing tools on public website.

2.3.1.1. Selecting Initial Set of Frameworks to Code. Since improving the field's comprehension of how culture and context affect what social, emotional, and associated skills are designed, defined, mentioned, and applied across various international environments was a key goal of the Taxonomy Project's overseas operations, interview

transcripts were also analyzed to obtain insight on how skills are interpreted and addressed from a global perspective, with an emphasis on the social implications and context.

While selecting the frameworks, the inclusion criteria was mainly based in three major points as

- Being representative of a wide range of disciplines
- Being widely adopted by educators
- Having descriptive skills, traits, competencies, strengths, mindset, and/or attributes that are defined and can be coded

2.3.1.2. Collecting General Information about Each Framework. All the frameworks are defined, and an online framework profile is developed for each to clarify what is contained within them. These profiles provide information about the types of data and resources that answer crucial issues including context, culture, related outcomes, assessment and more. These profiles also provide an overview of the goals, designs, and major characteristics of each framework. An overview of these globally common and respectively good frameworks involved in the Taxonomy Project are added on the ANNEXES.

2.3.1.3. Coding the Frameworks. As this coding system is an inevitable step for the unified categorization of distinct international frameworks, it also provided a great value for the comparison of frameworks thanks to the similarity index. Based on the number of overlapping codes two terms received, the similarity index determines how closely connected they are. In short, the database assigns a similarity index score to each pair of terms, and this supports the creating interactive tools for framework comparison or any further interest.

2.3.1.4. Creating Interactive Tools for Navigating Coded Frameworks. Thanks to this coding system and its outcomes, three main data-based online tools are created to identify similarities and differences across widely used frameworks. These are

- Explore Domain Focus: This tool provides information about how much each framework focuses on six domain areas of SEL.
- Discover Framework Connections: This tool provides information about where skills in one framework are related to skills in another.
- Identify Related Skills: This tool provides information about where similar SEL skills appear across frameworks.

2.3.1.5. Sharing Tools on Public Website. All the work and online interactive tools are publicly shared on the Explore SEL website (http: //exploresel. gse. harvard. edu/) for a common understanding of the terms, definitions and framework comparisons

2.3.2. Taxonomy Project Deliverables Used in the Current Study

The primary objective of the project is to preserve the accuracy of each framework while retaining crucial details and connections to supporting evidence. It involves tracking 40 different competencies within each framework, encompassing over 550 widely recognized social, emotional, and related skills distributed across 23 subdomains and 6 major domains. As a result, the project produces 177 statements based on these 6 dimensions, with 136 statements specifically focused on the 5 dimensions and 19 sub-dimensions examined in the current study.

However, two limitations are considered: the age group's limited attention span and the practical challenges in convincing schools about the scale's duration. To address these limitations and remain focused on the main purpose of developing a standardized assessment tool, the decision is made to continue with the 5 main dimensions while excluding the cognitive dimension. This is because the cognitive dimension can be assessed through other academic measurement tools, such as a math test.

To reduce the number of statements, several steps are taken:

- Six commonly used SEL frameworks (CASEL, Big Five Personality Traits, Character Lab, Emotional Intelligence, OECD, and WHO Skills for Health) are identified.
- The 136 statements are checked for their alignment with these 5 frameworks.
- Expert academicians are consulted to assess the appropriateness of each statement for its specific sub-dimension and dimension. They resulted in a list of 53 statements.
- Four additional statements are added for statistical reasons, ensuring a minimum of 3 statements for each sub-dimension.
- The 57 statements are modified to form a Likert scale in three steps: creating a modified version of each item for inclusion in the scale, adapting the language to the comprehension level of middle school students, and translating and validating the Turkish version of the items to ensure suitability for the scale.
- As the final step, item number 55 was removed from the scale due to a printing error, signifying the completion of the project. To address this issue, it was discovered that item number 55 duplicated item number 40. Consequently, item number 55 has been excluded from the results analysis and the scale, resulting in a final scale comprising 56 items.

3. METHODOLOGY

3.1. Sampling and Participants

The sample of the current study is selected by convenient sampling. It is planned to include gender balanced 5th and 6th grade students from private and public schools located in Istanbul/Turkey. While the original intention was to include a balanced representation of 5th and 6th grade students from both private and public schools in Istanbul, Turkey, the collection of sample data was limited to public schools due to practical constraints.

Data was collected from four public schools, each with a unique income demographic, spanning from upper-middle to lower-middle-income families. These schools are located within the inner city, primarily attended by parents holding professional positions in either the corporate or public sectors.

Interviews regarding the items on the scale before it is implemented were held with 5 volunteer students. The items' clarity and timing were evaluated, and any required adjustments was made considering the interviews.

Determining the appropriate sample size for a Likert-type scale with 57 items requires consideration of several factors. While there is no hard and fast rule, a commonly recommended guideline is to aim for 15 or 20 respondents per item (Clark andWatson, 1995; DeVellis, 2003). This sample size guideline is based on the principle of having enough data to ensure that each item is being accurately and consistently measured across the sample. Based in this guideline, a sample size of around 850 respondents would be appropriate for the current study.

After the implementation of the scale, the numbers of participants in the sample are presented in Table 3.1. The study's sample size consists of 890 5th and 6th graders

from public schools in İstanbul, Turkey. Regarding the gender distribution, there were 395 girls, 461 boys. Furthermore, out of the total sample, 446 students were in the 5th grade and 444 students were in the 6th grade.

Table 3.1. The sample according to grade and gender (N=893).

Grade				
Gender		5th	6th	Total
	Girls	215	214	429
	Boys	231	230	461
	Total	446	444	890

3.2. Instrument

3.2.1. Instrument of the Current Study

The current assessment tool is planned to be a Likert Type instrument, made up of 57 endorsement items anchored by five answer options from 1- strongly disagree to 5- strongly agree. In keeping with taxonomy categorizations, it is designed to tap into a total number of 18 sub-dimensions to be assessed associated with five major dimensions (out of six, except cognitive dimension) of SEL which are Emotion, Social, Values, Perspectives and Identity. The details of major and sub-dimensions are presented below:

(i) Emotion

Emotional Knowledge and Expression

Emotional and Behavioral Regulation

Empathy/Perspective Taking

(ii) Social

Understanding Social Cues

Conflict Resolution/Social Problem Solving

Prosocial/Cooperative Behavior

(iii) Values

Ethical Values

Performance Values

Civic Values

Intellectual Values

(iv) Perspectives

Optimism

Gratitude

Openness

Enthusiasm/Zest

(v) Identity

Self-Knowledge

Purpose

Self-Efficacy/Growth Mindset

Self-Esteem

3.2.2. Items Selection

The end product of the Taxonomy Framework, developed by the Taxonomy Project of the EASEL Lab at Harvard University, includes 177 items for the six main dimensions: cognitive, emotions, social, values, perspectives, and identity (EASEL Lab at Harvard Graduate School of Education, n.d.). When issues like practicability of the tool and average concentration time of middle school children are considered, it was a must to reduce the total number of items - 177. For this aim, the first object was to exclude the cognitive dimension from this development process. Since the cognitive side can be measured through several cognitive assessment tools and even with several questionnaires based on curricula, the idea was to continue with the other five

main dimensions which includes a total number of 136 items. Even 136 items were not practical to be applied in this research easily. Consequently, the next step involved consulting with a team of expert SEL researchers. These experts had diverse publications, including articles, book chapters, books, and specialized training materials related to SEL.

Drawing upon their respective backgrounds, they made substantial contributions to the scale's conceptual refinement, essentially validating its content. Each item underwent a meticulous examination, assessing its alignment with specific sub-dimensions and its linguistic suitability for comprehension by children aged 10-12. It's worth noting that one of the experts possessed a linguistic background, being a native Turkish speaker with expertise in English linguistics, which was a notable asset during the translation process.

As previously discussed, the goal was to take into account the attention span of the target age group (10-12 years) and minimize the number of items as much as possible. Additionally, consideration was given to the equitable distribution of items among various sub-groups, and the condition of including at least 3 items and not exceeding 4 items, if possible, was established subsequent to the final review of the items by expert academicians. In cases where certain sub-dimensions, such as gratitude and zest, contained only one item, additional items were generated to address this issue.

All in all, a larger pool of items was reduced to 57 by an expert group of SEL researchers and the final items were also reviewed by teachers currently working in middle schools to ensure the language appropriateness.

Upon completion of the data collection process, it was realized that the two items (item 55 and item 40) shared a remarkable similarity. As a consequence, one of the items, specifically item 55, was excluded from the scale and the final form of the scale is consisted of 56 items. Distribution of items among the sub-domains is outlined in detail as follows:

(i) Emotion (items [1, 9])

Emotional Knowledge and Expression (EKE: item 1, item 2, item 3)

Emotional and Behavioral Regulation (EBR: item 4, item 5, item 6)

Empathy/Perspective Taking (EPT: item 7, item 8, item 9)

(ii) Social (items [10, 19])

Understanding Social Cues (USC: item 10, item 11, item 12)

Conflict Resolution/Social Problem Solving (CR: item 13, item 14, item 15)

Prosocial/Cooperative Behavior (PCB: item 16, item 17, item 18, item 19)

(iii) Values (items [20, 31])

Ethical Values (EV: item 20, item 21, item 22)

Performance Values (PV: item 23, item 24, item 25)

Civic Values (CV: item 26, item 27, item 28)

Intellectual Values (IV: item 29, item 30, item 31)

(iv) Perspectives (items [32, 40] and item 56 and item 57)

Optimism (OPT: item 32, item 33, item 34)

Gratitude (GR: item 35, item 36, item 57)

Openness (OPE: item 37, item 38, item 39)

Enthusiasm/Zest (ZEST: item 40, item 56)

(v) Identity (items [41, 54])

Self-Knowledge (SK: item 41, item 42, item 43)

Purpose (PUR: item 44, item 45, item 54)

Self-Efficacy/Growth Mindset (GM: item 46, item 47, item 48, item 49)

Self-Esteem (SE: item 50, item 51, item 53)

3.2.3. Construct Definitions

In this section, an explanation of the constructs is provided along with specific examples of items. However, for further reference, a detailed table is presented in the ANNEXES section, specifically in Annex#2, which includes one item example for each sub-dimension. The table showcases the following steps:

- The item sourced from the Taxonomy project's outcome - Explore SEL website.
- The modified version of the item intended for inclusion in the scale.
- The version of the item modified to align with the language comprehension level of middle school students.
- The translated and validated version of the item in Turkish, ensuring its suitability for the scale.

3.2.3.1. Emotion. As emotion is about what an individual feels, it also might be considered as a skill that allows persons to identify their own feelings. As with most of the SEL skills, being aware of the feeling is of great importance also for this dimension.

This domain is mainly mentioned with several forms or related attempts of the term emotion such as emotional regulation (International Rescue Committee, 2016) or emotional intelligence (Mayer *et al.*, 1999). Moreover, the core definition for the term emotion domain as Taxonomy Project stated:

> "The Emotion domain includes skills that help you recognize, express, and control your emotions as well as understand and empathize with others. Skills in this domain are important not only for managing your own feelings and behavior, but also for interacting with and responding to others in prosocial ways. Specific skills in this area include: Emotion Knowledge and Expression, Emotion and Behavior Regulation, and Empathy and Perspective-taking", (EASEL Lab at Harvard Graduate School of Education, n.d., para. 1).

Example Statements for each subdimension of Emotion:

(i) Emotional Knowledge and Expression

I express my emotions to other people effectively (e.g., friends,family, teachers). (Çevremdeki insanlara duygularımı ifade ederim.)

(ii) Emotional and Behavioral Regulation

I use feeling words to explain my friends' or family's behavior (If I am angry on a behavior of my friend, I express myself to him/her mentioning how I feel, like being sad).

(Çevremdeki kişilerin davranışlarının bana hissettirdiklerini açıklamak için duygu sözcükleri kullanırım. Örneğin, üzüntümü arkadaşıma açık- larken "Bana haber vermeden sinemaya gitmen beni üzdü". şeklinde belirtirim.)

(iii) Empathy/Perspective Taking

I identify and acknowledge how other people's (my family, friends, teachers) feelings differ from my own feelings (including characters).

(Çevremdeki kişilerin duygularının benim duygularımdan farklı olabilece- ğini kabul ederim.)

3.2.3.2. Social. The social domain mainly refers to the capacity to understand others' viewpoints and have empathy for them, even those from different cultures and origins. Also, social awareness may be associated with the domain and defined as the capacity to perceive community resources and support, as well as to comprehend social and ethical norms for behavior (CASEL, 2015). Furthermore, the clear definition of the social domain by Taxonomy Project is done as:

> "The Social domain includes skills that help you accurately interpret other people's behavior, effectively navigate social situations, and interact positively with others. Skills in this domain are required to work collaboratively, solve social problems, build positive relationships, and coexist peacefully with others".

> "Specific skills in this area include: Understanding Social Cues, Conflict Resolution and Social Problem-solving, and Prosocial and Cooperative Behavior", (EASEL Lab at Harvard Graduate School of Education, n.d., para. 1).

Example Statements for each subdimension of Social

(i) Understanding Social Cues

I use social cues such as body language and tone of voice in standard and appropriate ways (refers to self)

(Kendimi ifade ederken uygun beden dili ve ses tonu kullanırım.)

(ii) Conflict Resolution/Social Problem Solving

During a conflict, I assert myself in an appropriate manner like using I messages, calmly and diplomatically stating values and preferences, etc.

(Anlaşmazlıklar sırasında kendimi uygun bir şekilde ifade ederim. Örneğin, anlaşmazlığı ortadan kaldırmak için davranışlarımın ve tercihlerimin ardında yatan sebepleri ben dili kullanarak açıklarım.)

(iii) Prosocial/Cooperative Behavior I effectively enter and engage in a variety of social situations.

(Farklı sosyal ortamlara aktif bir sekilde dahil olurum.)

3.2.3.3. Values. Values can be defined as an individual's internal assets including caring, honesty, equality and integrity (Scales, and Leffert, 2004). Unlike the other major domains, values is not called through how we act or show a specific feeling like mentioning emotional regulation rather than emotion itself. The definition provided by the Taxonomy Project for the values domain is

> "Values includes the skills, character traits/virtues, and habits that support you to be a prosocial and productive member of a particular community. It encompasses understanding, caring about, and acting upon core ethical values; the desire to perform to one's highest potential; and the habits required to live and work together with others as a friend, family member, and citizen".

> "Specific values in this area include: Ethical Values, Performance Values, Intellectual Values, and Civic Values", (EASEL Lab at Harvard Graduate School of Education, n.d., para. 1).

Example Statements for each subdimension of Values

(i) Ethical Values

I conduct myself with honesty and integrity through telling the truth and not cheating or stealing.

(Hile veya duzenbazlıga basvurmadan, durustce hareket ederim.)

(ii) Performance Values I am determined. I set one or more tasks/goals and show motivation or passion to complete them.

(Belirledigim hedefleri gerceklestirmek icin kararlılıkla ilerlerim.)

(iii) Civic Values

I volunteer to help when needed.

(Yardım gereken durumlarda yardım etmek icin gonullu olurum.)

(iv) Intellectual Values I express an eagerness to know and learn new things. I can define myself as a curious individual.

(Yeni bir seyler ogrenmeye karsı heyecan duyan, meraklı birisiyim.)

3.2.3.4. Perspectives. The perspectives domain includes dimensions related to an individual's viewpoint about him/herself and life. The Taxonomy Project's definition for this term is

> "Your perspective is how you view and approach the world. It impacts how you see yourself, others, and your own circumstances and influences how you interpret and approach challenges in your daily life. A positive perspective can help you protect against and manage negative feelings to successfully accomplish tasks and get along with others.
>
> Specific perspectives in this area include: Optimism, Gratitude, Openness, and Enthusiasm/Zest", (EASEL Lab at Harvard Graduate School of Education, n.d., para. 1).

Example Statements for each subdimension of Perspectives

(i) Optimism

I approach and reflect on challenging situations with a positive attitude.

(Zorlu durumlara olumlu bir sekilde yaklasırım.)

(ii) Gratitude
I express gratitude and appreciation for good and/or everyday things.
(Hayatımda iyi giden olaylara minnet ve sukran duyarım.)

(iii) Openness I am receptive to new and unfamiliar ideas, feelings, and experiences.
(Alışık olmadığım, ilk kez karsılastıgım deneyim ve duygulara hızlı adapte olurum.)

(iv) Enthusiasm/Zest I manage tasks by showing enthusiasm.
(Görev ve sorumluluklarımı motive bir sekilde yaparım.)

3.2.3.5. Identity. Identity is a perception of inner continuity with one's self that endures through time and across several social identities (such as race or ethnicity, occupation, culture, gender, and religion). An integrated identity acts as an internal guide for decision-making and offers a solid foundation from which to operate in the outside world. (Nagaoka *et al.*, 2015). The Taxonomy Project describe identity domain as:

> "Identity encompasses how you understand and perceive yourself and your abilities. It includes your knowledge and beliefs about yourself, including your ability to learn and grow. When you feel good about yourself; sure of your place in the world; and confident in your ability to learn, grow, and overcome obstacles, it becomes easier to cope with challenges and build positive relationships.
>
> Specific competencies in this area include: Self-knowledge, Purpose, Self-efficacy and Growth Mindset, and Self-esteem", (EASEL Lab at Harvard Graduate School of Education, n.d., para. 1).

Example Statements for each subdimension of Identity

(i) Self-Knowledge I recognize and understand my own strengths and weaknesses.
(Guclu ve gelisime acık yanlarımın farkındayım.)

(ii) Purpose I imagine the future; formulate life goals and ways to pursue them.
(Hayal ettigim gelecege yonelik hedefler yolunda ilerlerim.)

(iii) Self-Efficacy/Growth Mindset I see challenges as things that I can take on and overcome with time and effort.
(Zorlukları, yeterli zaman ve caba ile ustesinden gelebilecegim sey
ler olarak gorurum.)

(iv) Self-Esteem I extend kindness and understanding to myself through having self compassion and emotional self-respect.
(Kendime nazik ve anlayıslı davranırım.)

3.3. Data Analysis

In the current study, reliability (internal consistency reliability – Cronbach alpha) and, validity evidence including item analysis (content validity and construct validity) were provided to develop the SEL Skills Scale.

Reliability and validity are two critical aspects of assessment that provide essential information about the accuracy and interpretation of scores. Reliability measures the consistency of assessment scores and estimates the level of accuracy of scores, whereas validity offers information for the score interpretation and use.

3.3.1. Reliability

Crocker and Algina (1986) provided a definition of reliability as the extent to which measurements are not affected by errors and, therefore, can be considered dependable and consistent. In other words, reliability refers to the consistency and stability of assessment results over repeated administrations or observations. It is an important aspect of assessment because if scores are inconsistent, it becomes difficult to interpret them or draw valid conclusions about the construct being measured. The three main types of reliability - internal consistency, reliability over time and inter-rater reliability - provide different ways to estimate the consistency of assessment results and to identify potential sources of error. In the current study, the primary emphasis is on internal consistency reliability, which will be elaborated upon in detail.

3.3.1.1. Internal Consistency. One of the most prevalent kinds of reliability is internal consistency. The degree to which a measurement consistently produces findings across a sampling of items is referred to reliability (internal consistency of item responses).

What would the results look like when the items were different? It demonstrates the number of measurement errors brought on by items random selection from the construct domain (Rodriguez, 2022). One most commonly applied method of measuring internal consistency is the alpha coefficient, also known as Cronbach's Alpha (Cichetti, 1994). The Cronbach's Alpha coefficient has specific guidelines for interpretation, the details can be found in Cichetti (1994) and at Table 3.2.

Table 3.2. The cronbach's alpha criterion.

Coefficient of Cronbach's Alpha and Internal Consistency	
$\alpha \geqslant 0.9$	Excellent
$0.9 > \alpha \geqslant 0.8$	Good
$0.8 > \alpha \geqslant 0.7$	Acceptable
$0.7 > \alpha \geqslant 0.6$	Questionable
$0.6 > \alpha \geqslant 0.5$	Poor
$0.5 > \alpha$	Unacceptable

3.3.1.2. Reliability in the Current Study. When these three main types of reliability are considered, current study is planned to measure one of these reliability types - internal consistency. The main aim of the internal consistency is to ensure that measurement consistently produces findings across a sampling of items. In order to estimate internal consistency more precisely, the Cronbach's alpha coefficients was used.

3.3.2. Validity

The validity is defined as the answer of the question of a test measuring what it is supposed to measure (Borsboom *et al.*, 2004). However, it is not about the test, rather it is about the test scores' interpretation. As stated in one of the base articles, Cronbach and Meehl (1955), of the validity concept is about the complex question of whether test score interpretations are consistent with a nomological network made up of theoretical and observational terms or with a far more complex system of theoretical justifications, empirical evidence, and social implications of testing is at issue instead of

the straightforward factual question of whether a test measures an attribute (Messick, 1989).

For this score interpretation, three main types of validity measurement may be considered, which are content validity, criterion validity, and construct validity. These three types of validity are essential in ensuring that scores obtained from the assessment are meaningful and interpretable.

3.3.2.1. Content Validity. According to Crocker and Algina (2008), content validity refers to the degree to which a particular set of items accurately represents a content domain. Ensuring content validity requires item sampling adequacy, where the format of the instrument plays a significant role. Aspects like printing clarity, type size, and wording appropriateness are essential in determining the format. It's crucial to bear in mind that for a high degree of content validity, the content and format of the instrument must correspond to the sample of subjects to be measured and the descriptions of variables (Crocker and Algina, 2008; Fraenkel and Wallen, 2003).

Another important point is content validation for content validity. Creating and evaluating a table of specifications is essential for this (Crocker and Algina, 2008). The table of specifications should include dimensions, examples of items in the dimensions, and item numbers to define the content domains being measured and to ensure that a fair and representative sample of items appears on the questionnaire.

After an initial version of the instrument is developed, experts are asked to review the content and format of the instrument to investigate whether the items sufficiently sample the domain of interest.

The steps for expert opinion can be summarized as follows (Crocker and Algina, 2008; Fraenkel and Wallen, 2003):

(i) Clearly define the content domain.

(ii) Give definitions of what is to be measured, intended sample, and instruments to subject matter experts. Also, provide a structured framework for matching items to the content domain.

(iii) Experts read items in the instrument and rate the degree of match to a specified objective.

(iv) Collect and summarize the results of the matching procedures.

(v) Rewrite the items if necessary and resubmit them to the experts.

Regarding the step 4, one way to measure the congruence of an item with a particular objective is by using the index of congruence which is a statistical measure used to evaluate the degree to which an item is related to a particular objective or construct. This is done by having judges rate each item on how well it measures a specific objective or construct. Then, calculating the index of congruence for each item could be an additional asset. High congruence index values indicate strong alignment with the measured construct, with a desirable threshold of at least 0.50 for content validity (Hambleton, 1980; Rovinelli and Hambleton, 1977). The index is calculated using the formula

$$I_{ik} = \frac{N}{2N-2}(\mu_\kappa - \mu), \tag{3.1}$$

I_{ik} is the index of item-objective congruence for item i with respect to objective k, N is the total number of objectives, is μ_κ is the mean rating given by judges for item i on objective k, is μ is the overall mean rating given by judges for item i across all objectives (Turner and Carlson, 2003).

The content validity of the current study is demonstrated solely through the comprehensive table of specifications and getting feedback from the experts. Although using both the table of specifications and Hambleton's congruence index was initially considered, the extensive input provided by the experts during the item reduction phase has rendered the table of specifications sufficient for content validity assessment.

With full confidence in the recommendations of the experts, the study's content validity is established based on the detailed table of specifications.

3.3.2.2. Criterion Validity. Criterion validity refers to the extent to which an assessment correlates with a relevant external criterion (Crocker and Algina, 1986). The external criterion is usually a measure of the same construct being measured by the assessment. Criterion validity can be further divided into two types: concurrent validity and predictive validity. Concurrent validity refers to the degree to which an assessment correlates with an external criterion at the same time. Predictive validity, on the other hand, refers to the degree to which an assessment predicts a future criterion. Criterion validity is important in establishing the usefulness of the assessment for predicting future performance (AERA *et al.*, 2014).

3.3.2.3. Construct Validity. Construct validity refers to the extent to which an assessment measures the underlying theoretical construct it is designed to measure (Crocker and Algina, 2008). In other words, construct validity ensures that the assessment measures the intended theoretical construct and that it can distinguish between the construct being measured and other constructs. There are four widely used procedures for assessing construct validity: correlations between a measure of the construct and designated criteria, differentiation between groups, the multitrait-multimethod matrix, and factor analysis (Crocker and Algina, 2008).

The relationship between the construct and the designated criteria should be demonstrated through correlational evidence between a measure of the construct, such as academic performance, and the specified criteria, such as an intelligence test. If the relationship between the two couldn't be determined, the construct's effectiveness would be questioned (Kline, 2016).

Campbell and Fiske (1959) created the multitrait-multimethod matrix to assess construct validity. To determine how a measure correlates with other measures, con-

vergent validity coefficients and discriminant validity coefficients are used. Correlations between measurements of the same construct acquired using various assessment techniques are known as convergent validity coefficients. Contrarily, discriminant validity coefficients are correlations between measures of several constructs. Convergent validity coefficients should presumably be high, while discriminant validity coefficients should presumably be low.

Ultimately, factor analysis makes it possible to analyze the factor structure of the instrument. A statistical method known as factor analysis focuses on the connections among numerous different variables and provides an explanation for each one in terms of a common underlying dimension known as "factor". Confirmatory Factor Analysis (CFA) and exploratory factor analysis (EFA) are the two different types of factor analysis. In contrast to CFA, which evaluates how well the gathered data matches the suggested model, EFA identifies the underlying structure of a large number of variables.

3.3.2.4. Confirmatory Factor Analysis (CFA). Testing nested competing models and confirming a theory or probable correlations between variables are performed utilizing confirmatory factor analysis (Kline, 2015). Confirmatory factor analysis's primary objective is to statistically assess a factor model's relevance, or if the model is validated by the sample data (Schumacker and Lomax, 2004). How precisely the obtained data match the proposed model is the major concern in CFA. In other words, the potential for experimentally verifying the proposed model is investigated (Sharma, 1996).

Since factor analysis aims to determine which sets of observable data have the covariance characteristics identifying theoretical constructs or latent variables, the variety of factors and the variables used to assess each factor are specified in CFA. In CFA diagrams, observed variables are denoted by a rectangle or square box, while latent variables are depicted by a circle or an ellipse (Schumacker and Lomax, 2004). The path diagram uses single-headed arrows to represent regression coefficients and double-headed arrows to represent covariances. (Hox and Bechger, 1998; Schumacker and Lomax, 2004). Following, there are five phases to the CFA model: model specifi-

cation, model identification, model estimation, model testing, and model modification (Schumacker and Lomax, 2004).

3.3.2.5. Model Specification. A model must be specified in order to be studied or validated using the right theory, research, and data. In this phase, by identifying their linkages, the variables are identified as being relevant to the study and their connections (Schumacker and Lomax, 2004). At this step, a major potential problem is specification error, which occurs when a minor variable is included or when a significant variable is eliminated from the model. A model with a specification mistake is referred to as a mis-specified model since it produces parameter estimates that are systematically different from the model's actual parameter values.

3.3.2.6. Model Identification. Determining the identification of the model comes next when a confirmatory model has been provided. If each model parameter has a distinct and original solution that is based on both the theoretical model indicated by the population covariance matrix Σ and the sample data that produce the sample covariance matrix S, then the model has been successfully identified (Schumacker and Lomax, 2004).

The model must be "overidentified", which means that it includes more values in the sample covariance matrix S than the parameters that need to be estimated. The model will be just-identified", which cannot verify the model's adequacy, if the number of estimated parameters and values in the matrix S are equivalent.

Last but not least, a "underidentified" model emerges in which parameters cannot be predicted if the value of the sample covariance matrix S is smaller than the estimated parameters", (Schumacker and Lomax, 2004).

3.3.2.7. Model Estimation. In the estimation phase of CFA, the data from the sample and the designated model are used to estimate the model parameters. The goal is to

obtain parameter estimates that produce an inferred covariance matrix Σ that is very similar to the sample covariance matrix S. There are several estimation methods that can be applied in this step, including maximum likelihood (ML) and weighted least squares (WLS) (Schumacker and Lomax, 2004; Byrne, 2012).

Maximum Likelihood (ML) estimation is widely used in confirmatory factor analysis and assumes that the observed data are normally distributed with a mean of zero and a covariance matrix equal to the model-implied covariance matrix. ML estimation is considered the most efficient estimator when data are normally distributed, the observed variables are continuous and the sample size is relatively large (Kline, 2011).

Weighted Least Squares (WLS) estimation, on the other hand, is appropriate when the assumption of normality is not met, and the data are either non-normally distributed or have unequal variances (Kline, 2011; Byrne, 2012). WLS estimation gives more weight to the observations with smaller variances and less weight to the observations with larger variances, resulting in more accurate parameter estimates (Beauducel and Herzberg, 2006).

Ordinal data measured using Likert scales are common in social science research. When conducting CFA with Likert-type ordinal data, WLS is preferred over ML because it produces more accurate parameter estimates and standard errors and is less sensitive to violations of normality assumptions. Moreover, WLS provides better fit indices than ML estimation for models with ordinal data (Flora and Curran, 2014; Li, 2016). Therefore, WLS estimation method was used in the current study.

3.3.2.8. Model Testing. The critical next step once a model has been estimated is assessing if the fit of the model is "excellent". The minimum divergence between the sample and population covariance matrices is a sign of a successful model. This shows that the model is supported by sample data and that these matrices have a strong match (Schumacker and Lomax, 2004). To better understand the model fit, many fit indices are developed.

Comparative fit index (CFI) is one of the fit indices that is frequently suggested for comparing estimated and independence models (Schumacker and Lomax, 2004). The CFI has a range of 0 to 1. If the CFI is more than 0.95, the model is considered to be well-fitting (Ullman, 2001). On the other hand, the TLI, which stands for the Tucker-Lewis index, is another fit index that is not considerably affected by sample size. The TLI is an incremental and non-normed fit index, and a value greater than 0.95 indicates an improved model fit (Schumacker and Lomax, 2004).

The root mean square error of approximation serves as one other fit index (RMSEA). RMSEA compares the estimated and ideal model and uses degrees of freedom to determine the fit's adequacy (Ullman and Bentler, 2012). lower RMSEA values suggest better model fitting (Ullman and Bentler, 2012). A well-fitting model is implied by RMSEA values that are less than or near to 0.06. (Ullman and Bentler, 2012). RMSEA values greater than 0.10, however, indicate models that are not well fitted (Browne and Cudeck, 1993)

$$CFI = 1 - [(X^2_{model} - df_{model})/(X^2_{null} - df_{null})] \tag{3.2}$$

$$TLI \quad = \quad [(X^2_{null}/df_{null}) - (X^2_{model}/df_{model})]/[(X^2_{null}/df_{null}) - 1] \tag{3.3}$$

$$RMSEA = \sqrt{[X^2_M - df_M] \,/\, [N-1]\, df_M}. \tag{3.4}$$

The Formulae for the Root Mean Square Error of Approximation (RMSEA), the Tucker-Lewis Index (TLI), and the Comparative Fit Index (CFI) are also presented (Schumacker and Lomax, 2004);

3.3.2.9. Model Modification. The model must be adjusted to produce a model fitting better if the stated model is rated as unsatisfactory with different fit indices (Schumacker and Lomax, 2004). Modifications that are supported by a theory in order to be reasonable are one of the key components (One technique is the elimination of irrelevant parameters from the model and theory. The CFA software's modification indices are another technique that may be used to show the effects of predicted variances in

the model fit when a particular parameter alteration is done (Schumacker and Lomax, 2004).

3.3.2.10. Validity in the Current Study. To provide validity evidence for content validation, Taxonomy Project's content was used as template for the current items of the tool and expert opinion was planned to be done. As the first step, the summarized framework provided as outcome of the Taxonomy Project and items based in the 5 major dimensions were used. Thus, alignment between the items and dimensions can be ensured. Secondly, to collect expert opinion, several researchers of SEL topic were informed about the scope of the dimensions. The items were eliminated to from 117 items to 57 items -because of the limitation on the implementation of the tool- thanks to expert opinion. Afterward, experts were expected to contribute their ideas regarding the format, including the appropriateness of language. The selected items then were modified based on expert opinions to ensure they are comprehensible for middle school children (aged 10-12 years). Finally, all of the recommendations of the experts about format and analyses of calculations were justified.

3.3.2.11. CFA in the Current Study. The current study used confirmatory factor analysis to statistically assess whether the data collection through the defined items fits well with the expected dimensions as 5 major dimensions (emotion, social, values, perspectives, and identity) and 18 sub-dimensions. The adequacy of the model fit in confirmatory factor analysis was evaluated using fit indices.

The values of TLI, CFI, and RMSEA were examined against the established criteria mentioned earlier. Factor loadings were reported, and a cutoff value of 0.40 was used to evaluate their adequacy (Salkind, 2010). All in all, to provide construct validity, dimensions (emotion, social, values, perspectives, and identity) have been operationally defined. Mplus, which is a statistical modeling program that provides researchers with a flexible tool to analyze their data (Muthén and Muthén, 2017), was used to test factor structure of the scale via CFA.

3.3.3. Item Response Theory (IRT)

Item analysis is a crucial step in scale development and validation, which involves evaluating the characteristics of individual items to determine their effectiveness in measuring the construct of interest. Two commonly used approaches to item analysis are classical test theory (CTT) and item response theory (IRT) (Crocker and Algina, 1986).

CTT assumes that the observed score on a test is a combination of a true score and an error score. It relies on the calculation of item statistics such as item difficulty, item discrimination, to evaluate the performance of each item (Crocker and Algina, 1986). CTT is useful when the test comprises dichotomous or polytomous items with fixed response choices (Embretson and Reise, 2013).

On the other hand, IRT is a more contemporary approach to item analysis that is based on mathematical modeling of item performance. IRT assumes that the probability of responding correctly to an item is a function of the individual's ability and the item's characteristics, including difficulty, discrimination, and guessing when evaluating an achievement test (Embretson and Reise, 2013). IRT offers several advantages over CTT, including the ability to estimate the latent trait and item parameters simultaneously, and the flexibility to accommodate different types of item response formats (Embretson and Reise, 2013). Additionally, IRT models can handle various types of item response formats, including dichotomous, polytomous, and continuous, making them highly versatile for a wide range of testing scenarios (Embretson and Reise, 2013).

In summary, IRT is often touted as a modern alternative to CTT, and it has gained increased attention lately due to its potential to provide more comprehensive information than CTT. Thus, the current study used IRT to analyze the performance of items in the SEL assessment tool. The use of IRT enabled more accurate estimates of item difficulty and discrimination and a better understanding of the latent construct being measured when developing a scale. This section introduces fundamental IRT

concepts, including the Item Characteristic Curve (ICC). Item Parameters, Logistic Models, and related assumptions.

3.3.3.1. Item Characteristic Curve (ICC). ICC is a fundamental concept in IRT, that shows how the probability of correctly responding to an item varies according to the ability level of an individual for achievement tests. The curve is typically sigmoidal in shape, with low probabilities of success at low ability levels and high probabilities of success at high ability levels. The slope of the curve represents the item's difficulty level, while the point of maximum discrimination indicates the level of ability at which the item is most informative (Embretson and Reise, 2000). Briefly, the ICC graphically displays how the probability of a correct response to an item varies according to the ability level of an individual (Baker, 2001).

Polytomous items, such as Likert type scales, have more than two response options, which results in a unique ICC for each option. The curves for each option are shifted along the ability scale, indicating that the probability of endorsing a particular response option changes with ability level.

The ICC is a valuable tool for item selection and test evaluation in IRT. Researchers can use the item parameters derived from the ICC, such as difficulty and discrimination, to evaluate the quality of test items and to develop tests that are well-suited to their intended purpose (van der Linden and Hambleton, 1997) as they can also use it to identify problematic items that may need to be revised or removed from a test (DeVellis, 2017). For polytomous items, ICC has a shape like the below figure (Figure 3.1).

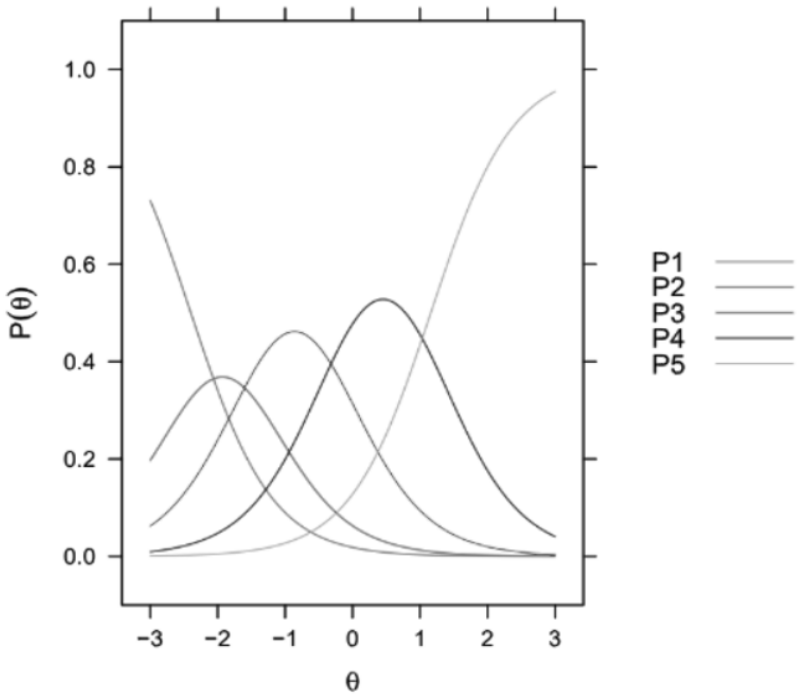

Figure 3.1. ICC for polytomous items.

3.3.3.2. Item Parameters. Item parameters are essential components of IRT models and were used to describe the characteristics of individual test items. The two most important item parameters in IRT in scale development are difficulty and discrimination (Baker and Kim, 2004).

The degree of skill or knowledge a test taker needs to appropriately respond to an item is referred to as its difficulty. The item's position on the ability scale is indicated by the difficulty parameter (b). A greater value of b denotes that item is less likely to be endorsed than an item with a lower value of b (DeVellis, 2017). The difficulty parameter is usually displayed on a continuous scale, with zero denoting an average level of difficulty (Embretson and Reise, 2000). The scale can vary from negative to positive values.

Contrarily, the degree to which an item can distinguish between people with high and low levels of ability is referred to as discrimination. The ICC slope is reflected by the discrimination parameter (a), which symbolizes discrimination. A larger value of a denotes a stronger ability of the object to distinguish between people of high and low

aptitude, while a lower value of a denotes a weaker ability. According to Baker (2001), discriminating levels between .01 and.34 are classified as very low, .35 and.64 as low, .65 and 1.34 as moderate, 1.35 and 1.69 as high, and values more than 1.70 as very high.

Depending on the model's complexity and the type of items being evaluated, IRT models may additionally include additional item parameters in addition to difficulty and discrimination. For instance, it may be necessary to specify threshold values for polytomous items with more than two response categories in order to specify the level of skill needed to choose each response choice (Nering and Ostini, 2010). For a given item, the number of threshold parameters needed is equal to the number of response alternatives less one. For instance, a question with five possible answers would need four threshold values.

Overall, item parameters play a critical role in IRT models, as they provide information about the characteristics of individual test items and allow for the estimation of examinee abilities on a continuous scale. By analyzing the relationship between item parameters and examinee abilities, IRT models can provide more precise and accurate estimates of examinee abilities than traditional methods such as CTT.

3.3.3.3. Logistic Models. Logistic models are a set of mathematical models used in IRT to estimate item parameters, including difficulty and discrimination. There are three main logistic models for achievement tests: one-parameter, two-parameter, and three-parameter models.

The simplest model, the 1-Parameter Logistic Model (1PLM), estimates only the item difficulty parameter, assuming that all items are equally discriminating, and that low-ability examinees do not respond to items correctly by guessing. The most commonly used model is the 2-Parameter Logistic Model (2PLM), which includes two item parameters: item difficulty and item discrimination (Embretson and Reise, 2000), while the 3-Parameter Logistic Model (3PLM) includes a pseudo-guessing parameter in

addition to the difficulty and discrimination parameters (Reckase, 2009). The guessing parameter is commonly used in achievement tests where examinees may attempt to guess the correct answer for an item (Baker and Kim, 2004; Crocker and Algina, 2008).

When the 1PLM, 2PLM and 3PLM are used in achievement tests, IRT models used most frequently in scales are the graded response model (GRM) and the generalized partial credit model (GPCM). Strongly Disagree (0), Disagree (1), Agree (2), and Strongly Agree (3) are some examples of sorted categorical responses that are frequently included in questions using GRM (DeVellis, 2017). Following, the current study is also used GRM.

3.3.3.4. Assumptions. IRT relies on certain assumptions in order to estimate the item and person parameters accurately. The key assumptions are unidimensionality, local independence, and monotonicity (DeVellis, 2017; Embretson and Reise, 2000; Nering and Ostini, 2010).

Unidimensionality assumes that a test measures a single underlying construct, such as language proficiency or mathematical ability. Unidimensionality is assessed by parallel analysis scree plot and the ratio of the eigen values. In addition, local independence assumes that responses to an item are not influenced by the responses to any other item. This means that there should be no systematic relationship between the responses to different items on the test. Local independence is assessed by Yen's Q3 Statistic Test. Monotonicity assumes that examinees who are higher in the construct being measured should have a higher probability of answering an item correctly than examinees who are lower in the construct. This means that the item characteristic curve should be monotonically increasing. Violations of these assumptions can lead to inaccurate parameter estimates, biased scores, and incorrect inferences (DeMars, 2013).

4. RESULTS

4.1. Reliability Results

The reliability of the scores obtained in the current study were subsequently analyzed and presented in the below Table 4.1.

Taking a closer look at each factor, it was found the Emotion factor to exhibit acceptable internal consistency, with a Cronbach's alpha value exceeding 0.70. The Social factor showcased a good level of internal consistency, surpassing the 0.80 threshold with a value of 0.84. The Values factor displayed excellent internal consistency, achieving a Cronbach's alpha value of 0.90. Similar to the Social factor, Perspectives also exhibited a good level of internal consistency. Lastly, the Identity factor demonstrated outstanding consistency, with a Cronbach's alpha value of 0.91, surpassing the 0.90 threshold. These consistent findings provide robust evidence for the reliability and internal consistency of the individual factors within the scale.

Table 4.1. The cronbach's alpha analysis.

Factors	N (Numbers of Items)	Cronbach's Alpha	Corrected Item-Total Correlation Min	Corrected Item-Total Correlation Max
Emotion	9	0.78	0.23	0.55
Social	10	0.84	0.47	0.66
Values	12	0.90	0.49	0.72
Perspectives	11	0.89	0.43	0.68
Identity	14	0.91	0.45	0.73
Total	56	0.97	0.32	0.72

4.2. Validity

To ensure the validity of the current scale, both content and construct validity were addressed. Detailed analysis results are presented below.

4.2.1. Content Validity Results

Content validation was conducted using the Taxonomy Project's content as a template for the tool's items, and expert opinions were sought. The process involved aligning the items with the dimensions using the summarized framework. Expert input resulted in reducing the item pool from 117 to 56 items due to implementation limitations. Experts also provided feedback on format, including language appropriateness, and the selected items were modified based on the comprehensibility level for middle school children (10-12 years) according to their recommendations. All format and calculation analysis recommendations from the experts were duly justified.

The table of specifications, which included dimensions, examples of items, and item numbers, played a crucial role in defining the measured content domains and ensuring a fair and representative sample of items in the questionnaire. Thus, content validity was established through this table.

4.2.2. Construct Validity

Confirmatory factor analysis was conducted to provide evidence of construct validity.

4.2.2.1. CFA Results. To assess the fit of the proposed structure with the student answers, a confirmatory factor analysis was performed. The analysis involved loading all 56 items onto 5 distinct main dimensions and 18 subdimensions.

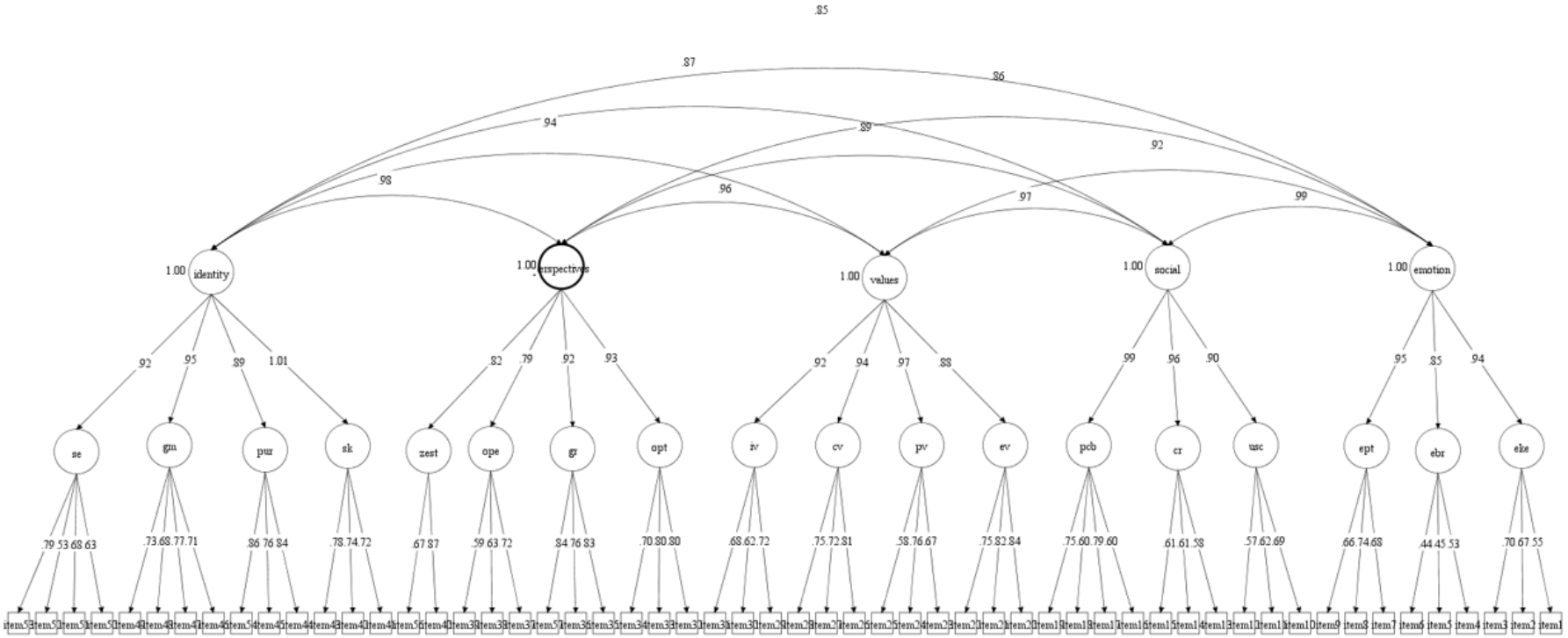

Figure 4.1. CFA Diagram.

Subsequently, the TLI, CFI, and RMSEA values resulting from the confirmatory factor analysis. Based on the obtained TLI, CFI, and RMSEA values, it was determined that the collected data exhibited an acceptable level of compatibility with the proposed five main dimensions and 18 subdimensions of the SEL Skills Scale (TLI=0.935 close to 0.950; CFI=0.939 close to 0.950; RMSEA=0.041 less than 0.060). Additionally, the relationships between individual sub-dimensions and their respective items were found to demonstrate a satisfactory fit according to the standardized factor loadings (all larger than 0.40). The comprehensive results are provided below for further review.

Table 4.2. The fit indices in confirmatory factor analysis.

	χ^2	df	χ^2/df	TLI	CFI	RMSEA (90% CI)
5-Factor Model	3.769.662	1456	2.589	0.935	0.939	0.042 (0.041; 0.044)

Table 4.3. The standardized factor loadings.

Variables and Items	**Estimate**	**S.E.**	**ρ-value**
EKE By			
Item 1	0.553	0.029	0.000
Item 2	0.673	0.024	0.000
Item 3	0.697	0.024	0.000
EBR By			
Item 4	0.532	0.035	0.000
Item 5	0.447	0.037	0.000
Item 6	0.443	0.036	0.000
EPT By			
Item 7	0.680	0.022	0.000

Table 4.3. The standardized factor loadings. (cont.)

Variables and Items	**Estimate**	**S.E.**	**ρ-value**
Item 8	0.744	0.023	0.000
Item 9	0.659	0.025	0.000
USC By			
Item 10	0.689	0.026	0.000
Item 11	0.619	0.026	0.000
Item 12	0.574	0.026	0.000
CR By			
Item 13	0.581	0.026	0.000
Item 14	0.613	0.027	0.000
Item15	0.606	0.025	0.000
PCB By			
Item 16	0.598	0.024	0.000
Item 17	0.786	0.018	0.000
Item 18	0.599	0.024	0.000
Item 19	0.747	0.018	0.000
EV By			
Item 20	0.843	0.016	0.000
Item 21	0.817	0.015	0.000
Item 22	0.750	0.021	0.000
PV By			
Item 23	0.670	0.022	0.000
Item 24	0.757	0.019	0.000
Item 25	0.581	0.024	0.000
CV By			
Item 26	0.808	0.016	0.000
Item 27	0.723	0.019	0.000
Item 28	0.747	0.019	0.000

Table 4.3. The standardized factor loadings. (cont.)

Variables and Items	**Estimate**	**S.E.**	**ρ-value**
IV By			
Item 29	0.719	0.022	0.000
Item 30	0.619	0.024	0.000
Item 31	0.678	0.024	0.000
OPT By			
Item 32	0.803	0.017	0.000
Item 33	0.795	0.018	0.000
Item 34	0.700	0.022	0.000
GR By			
Item 35	0.835	0.016	0.000
Item 36	0.758	0.019	0.000
Item 57	0.844	0.017	0.000
OPE By			
Item 37	0.716	0.024	0.000
Item 38	0.633	0.026	0.000
Item 39	0.588	0.033	0.000
ZEST By			
Item 40	0.866	0.019	0.000
Item 56	0.674	0.024	0.000
SK By			
Item 41	0.719	0.019	0.000
Item 42	0.739	0.019	0.000
Item 43	0.777	0.017	0.000
PUR By			
Item 44	0.845	0.015	0.000
Item 45	0.759	0.018	0.000
Item 54	0.859	0.016	0.000

Table 4.3. The standardized factor loadings. (cont.)

Variables and Items	**Estimate**	**S.E.**	**ρ-value**
GM By			
Item 46	0.708	0.020	0.000
Item 47	0.765	0.019	0.000
Item 48	0.679	0.021	0.000
Item 49	0.728	0.020	0.000
SE By			
Item 50	0.628	0.025	0.000
Item 51	0.680	0.023	0.000
Item 52	0.534	0.029	0.000
Item 53	0.791	0.025	0.000

4.3. IRT Results

IRT in the current study is applied to analyze item performance in the SEL assessment tool, providing more accurate estimates of difficulty and discrimination.

4.3.1. Assumptions

In order to accurately estimate item and person parameters, IRT relies on certain assumptions, as discussed in detail in the methodology section. These key assumptions include unidimensionality, local independence, and monotonicity (DeVellis, 2017; Embretson and Reise, 2000; Nering and Ostini, 2010).

4.3.1.1. Unidimentionality. The scree plot, represented in Figure 4.1, and the ratio of first-to-second eigenvalues (eigen value #1=19.96; eigen value #2=1.67; eigen value #1/ eigen value #2=11.95 $>$ 4) demonstrated that unidimensionality assumption was not violated.

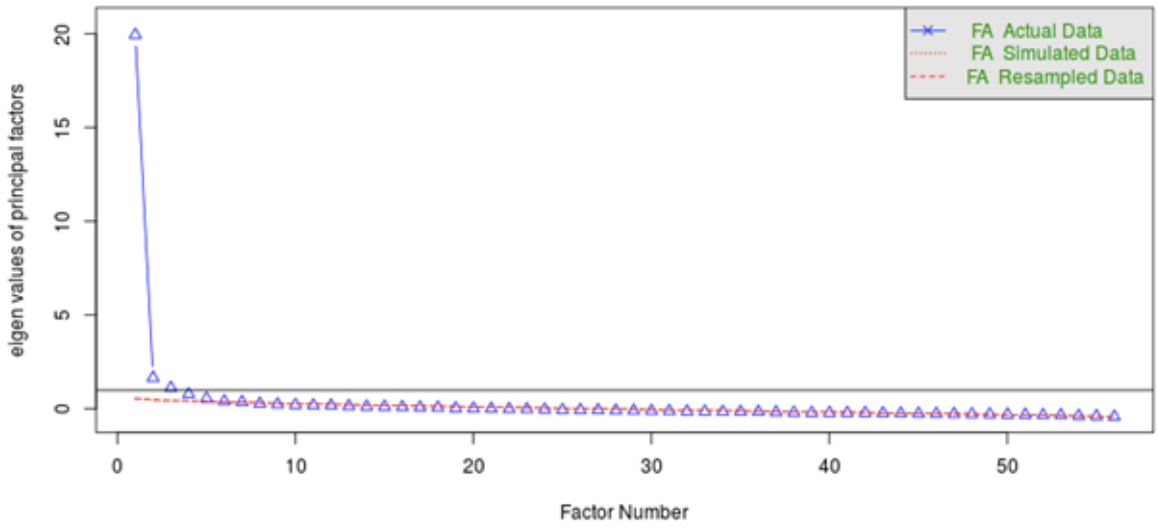

Figure 4.1. Parallel analysis scree plots.

4.3.1.2. Local Independence. To verify the absence of any systematic connection between responses to various items on the scale, Yen's Q3 Statistic Test is conducted to assess local independence assumption. While there isn't a single exact critical value that applies universally, Christiensen and colleagues (2016), in their simulation studies, indicated that the Q3 critical value remains relatively consistent at approximately 0.2 higher than the average correlation. In the tested parameter ranges, any remaining correlation surpassing 0.2 above the average correlation seems to suggest linkage disequilibrium, while a residual correlation indicating independence with a value exceeding 0.3 above the average appears improbable. As 0.3 is the critical value for the residual correlation values obtained from Yen's Q3 test, for item pairs above this value, it can be said that it violates local independence (Yen, 1984).

Consequently, the residual correlation values associated with each pair are observed. There, notably, is one remarkable item pair from the 'purpose' subdimension, identified as item 44 and item 45, exhibiting a correlation of 0.315. This pair violates the assumption of local independence. The detailed numerical values from the result matrix have been appended for reference.

4.3.1.3. Monotonicity. The monotonicity of the IRT analysis in the current study was confirmed by examining the ICCs of the 56 items, which are included in the ANNEXES for reference, specifically in Annex #5. Therefore, monotonicity assumption was not violated.

4.3.2. IRT Model Fit

The current study utilizes the graded response model to analyze the development of a Likert-type scale for categorical responses ranging from Strongly Disagree (1) to Strongly Agree (5), as described in the methodology section.

Table 4.4. The fit indexes.

Model	**AIC**	**BIC**
Graded Response Model	118605.72	119948.20
Generalized Partial Credit Model	118876.76	120170.25

When evaluating the fit indices of both GRM and GPCM, it is observed that the AIC and BIC values indicate a better fit for the GRM in this IRT analysis. It is important to note that smaller values of these fit indices indicate a better alignment between the model and the data.

4.3.3. Item Parameter

The discrimination parameter (a) represents the slope of the characteristic curve, while the difficulty parameters (b), also known as location parameters, indicate the four intersection points on the item characteristic curves. Additionally, the item parameter estimations in this study are shown in Table 4.5. Upon closer inspection, considering Baker's interpretation of discrimination values, it is observed that item 6 has a moderate discrimination level (0.689), which is the lowest among all the items in this scale. On the other hand, items such as item 57 (2.255), item 26 (2.240), and item 35 (2.199) exhibit very high discrimination levels.

Upon examining the values of b, the lowest 'b' value belongs to item 12, denoted as b1, with a value of -3.034, whereas the highest 'b' value belongs to item 6, denoted as b4, with a value of 2.466.

Table 4.5. The item parameter estimations.

Items	**a**	**b1**	**b2**	**b3**	**b4**
1	1.039	-2.840	-1.705	-0.015	1.726
2	1.402	-2.581	-1.988	-0.858	0.456
3	1.430	-2.533	-1.913	-1.117	0.090
4	0.840	-2.725	-1.626	-0.152	1.585
5	0.706	-2.858	-1.430	0.261	2.351
6	0.689	-2.604	-1.351	0.510	2.466
7	1.392	-2.746	-1.913	-0.873	0.580
8	1.658	-2.295	-1.846	-1.189	-0.031
9	1.283	-2.607	-2.018	-1.170	-0.015
10	1.387	-2.573	-1.731	-0.535	0.787
11	1.128	-2.661	-1.989	-0.893	0.411
12	1.049	-3.034	-2.022	-0.466	0.861
13	1.158	-2.603	-1.716	-0.265	1.236
14	1.263	-2.521	-1.812	-0.784	0.593
15	1.215	-2.592	-1.579	-0.089	1.387
16	1.237	-2.339	-1.381	-0.251	0.906
17	2.086	-2.279	-1.810	-1.055	0
18	1.274	-2.629	-1.725	-0.763	0.429
19	1.954	-2.088	-1.783	-0.739	0.268
20	2.007	-2.177	-1.772	-0.998	0.007
21	1.893	-2.308	-1.745	-0.959	0.155
22	1.694	-2.322	-1.747	-0.847	0.190
23	1.556	-2.397	-1.948	-0.947	0.166

Table 4.5. The item parameter estimations. (cont.)

Items	**a**	**b1**	**b2**	**b3**	**b4**
24	1.953	-2.027	-1.627	-0.694	0.264
25	1.206	-2.610	-1.489	-0.058	1.226
26	2.240	-2.232	-1.717	-0.968	0.245
27	1.744	-2.583	-1.94	-0.931	0.231
28	1.868	-2.255	-1.607	-0.715	0.513
29	1.564	-2.241	-1.460	-0.560	0.351
30	1.232	-2.635	-1.700	-0.557	0.746
31	1.466	-2.330	-1.389	-0.096	1.072
32	2.016	-2.181	-1.576	-0.801	0.329
33	2.002	-1.976	-1.607	-0.963	-0.074
34	1.540	-2.075	-1.464	-0.389	0.772
35	2.199	-2.021	-1.616	-0.974	-0.060
36	1.805	-2.215	-1.589	-0.638	0.505
37	1.264	-2.533	-1.571	-0.098	1.173
38	1.007	-2.484	-1.419	0.040	1.374
39	0.918	-2.517	-1.635	-0.404	0.752
40	1.812	-2.006	-1.352	-0.471	0.646
41	1.866	-2.055	-1.606	-0.621	0.431
42	1.983	-2.144	-1.63	-0.712	0.290
43	2.135	-2.095	-1.675	-0.900	0.017
44	2.035	-2.004	-1.571	-0.699	0.220
45	1.588	-2.177	-1.389	-0.351	0.688
46	1.622	-2.355	-1.696	-0.479	0.665
47	1.814	-1.985	-1.514	-0.735	0.171
48	1.539	-2.398	-1.641	-0.409	0.790
49	1.639	-2.126	-1.651	-0.789	0.304

Table 4.5. The item parameter estimations. (cont.)

Items	**a**	**b1**	**b2**	**b3**	**b4**
50	1.216	-2.001	-1.265	-0.205	0.946
51	1.376	-2.038	-1.422	-0.495	0.508
52	0.975	-2.107	-1.328	-0.139	1.087
53	1.846	-2.075	-1.696	-1.029	-0.404
54	2.154	-1.929	-1.491	-0.732	0.288
56	1.197	-2.297	-1.557	-0.432	0.861
57	2.255	-1.865	-1.446	-0.983	-0.258

Given that all the assumptions of unidimensionality, local independence, and monotonicity have been confirmed, and the discrimination values of all the items are moderate or higher, it can be concluded that the IRT results align with the intended development of the SEL Skills Scale.

5. DISCUSSION AND CONCLUSION

The core objective of the current study was the development of a student-reported SEL skills scale, drawing inspiration from the Taxonomy Project devised by the EASEL Laboratory at the Harvard Graduate School of Education. The standardized scale is designed to encompass five main dimensions, integrating a total of 56 items for thorough analysis. Prior to its implementation, an initial interview phase involving a group of five students was conducted to assess the scale's duration and clarity. Following this, the scale is evaluated through the CFA, involving a sample of 893 5th and 6th graders (aged 10-12 years) from diverse public schools. Once robust CFA results were achieved, IRT was applied to evaluate the performance of individual items within the SEL assessment tool, offering a more profound comprehension of the measured construct. In brief, the current study's pivotal contribution lies in the development of a standardized SEL skills scale harmonized with the SEL framework derived from the Taxonomy Project, ultimately aimed at enhancing precision and transparency in the field.

Table 5.1. The descriptive statistics details of each dimension.

	Mean	Standard Deviation	Variance	N of Items
Emotion	33.63	6.229	38.806	6
Social	38.11	7.336	53.820	10
Values	47.25	9.329	87.026	12
Perspectives	46.01	9.511	90.456	12
Identity	54.36	11.465	131.465	14
Total	223.32	39.038	1.524.002	56

5.1. Assessment in SEL

Referring to the study by Berg and colleagues in 2017, it was revealed that a total of 136 SEL programs collectively identified 748 competencies. Given the absence of a definitive SEL skills framework and the lack of consensus among educators, profession-

als, and policymakers regarding the essential traits, their terminology, and potential interrelationships (Jones *et al.*, 2016), the primary objective of the current study was to develop a standardized assessment tool for SEL skills. This tool is constructed based on the unified SEL framework that emerged from the Taxonomy Project.

Having a common assessment tool has been a challenging issue for years (Zins *et al.*, 2004) but armed with this universal framework, the necessity for a consistent and standardized SEL assessment tool became evident. As response, a scale for measuring SEL skills was developed through the current study. The given statements to define the sub-dimensions and dimensions of the Taxonomy framework are modified and used to develop the SEL skills scale. The results indicated that the developed Likert type scale is significantly assessing the 5 major and 23 sub-dimensions as aimed.

By navigating the intricate landscape of SEL assessment tools, the developed SEL skills scale equips educators and researchers with a valuable resource that promotes consistent, effective, and targeted development of social and emotional competencies among students. As the educational landscape continues to evolve, this tool stands as a cornerstone in nurturing holistic student well-being and growth.

5.1.1. Significance of a Standardized SEL Skills Scale

As an outcome of the current study, the standardized SEL Skills Scale is significant in terms of answering to two main needs as providing a coherent assessment tool which compiles and links the key frameworks and expertise in the field of research, and supporting schools in determining the proper SEL program for their organizations because they will have the chance of defining the insufficient SEL skills of their students and their current programs' strengths. Therefore, this section examines the significant impact of the standardized SEL skills scale on the field.

5.1.1.1. A Coherent Assessment Tool. As Shoenert-Reichl and colleagues (2009) pointed out the lack of standardized assessment tools available for evaluating factors af-

fecting children's social and emotional wellbeing, significant progress has been made in the development of such tools since then. For instance, the CASEL has created a framework for assessing five core competencies of SEL and offers a suite of assessments that have been validated for use in educational settings (Dusenbury *et al.*, 2015). Similarly, the Assessment Work Group of the National Commission on Social, Emotional, and Academic Development has recommended a set of common metrics for evaluating SEL programs and policies (Jones and Kahn, 2017). However, despite these advances, there was still a need for improved and widely accepted measures that comprehensively evaluate SEL skills across diverse populations and settings. While some assessments may focus on specific skills or domains, there is a lack of consensus on the most critical SEL skills and how they should be assessed. The developed SEL skills scale as an outcome of the current study fosters a collective understanding within the field.

Despite the existence of various tools, their scope unfortunately falls short of being all-encompassing. An illustrative example is the DESSA, which assesses eight core social-emotional competencies, encompassing self-awareness, self-management, social awareness, relationship skills, goal-directed behavior, personal responsibility, decision-making, and optimistic thinking. These competencies correlate with the subdomains outlined within the Taxonomy Project's SEL framework. Conversely, the SEL skills scale developed within the current study adopts a more expansive approach, comprising five primary dimensions and 23 sub-dimensions, thus transcending the limitations of isolated subdomains.

Similarly, the SELSS, pioneered by Kabakçı and Owen in 2010 for the Turkish context, underscores the assessment of SEL skills among 6th and 8th grade students. This Likert-type scale categorizes SEL skills into four skill groupings-problem-solving skills, communication skills, self-esteem-enhancing skills, and coping with stress skills. These categories correspond to certain sub-domains encapsulated within the SEL skills scale, which aspires for universal inclusivity by harmonizing various perspectives from the field, a feature not universally present in scales such as those proposed by the Taxonomy Project.

All in all, many existing tools tend to emphasize the evaluation of specific skills or domains, thus underscoring the need for a more comprehensive and holistic approach. The current study has been embarked upon with a distinct purpose: to redress current inadequacies and also to lay the foundation for a more effective and nuanced evaluation of students' social and emotional proficiencies, recognizing the intricate tapestry and extensive dimensions of this dynamic field.

5.1.1.2. Aiding Schools in Defining Suitable SEL Program. Durlak and colleagues is (2011) declared that currently, most schools do not use evidence-based preventive strategies. Similarly, Blyth (2018) proposed that school teams should select a framework that respond to their needs so that they will have data to demonstrate outcomes if schools require a framework to communicate with stakeholders, to obtain buy-in, or to decide which specific competencies and abilities to develop. The result product of the current study may support to both practitioners and learners. In a possible usage of the scale as a pre-test and post-test for students' SEL skills' levels, it may contribute to their journey toward growth, offering insights into developmental trajectories and the effectiveness of educational programs.

5.1.1.3. Evidence-Based Educational Practices. Mahoney and colleagues (2018) demonstrated that comprehensive school based SEL programs have a favorable impact on involved pupils' performance in a wide range of crucial behavioral and academic results that are noticeable right away after the completion of the intervention and continue during several follow-up periods.

By systematically collecting data on students' SEL skills before and after the implementation of an intervention, educators can thoroughly evaluate the outcomes of the program and determine its efficacy. This approach not only equips educators to tailor their teaching methods but also cultivates a deeper understanding among both educators and students about specific dimensions of SEL like emotional intelligence, ethical values, gratitude, and self-esteem.

Following this initial assessment, the utilization of the same assessment scale upon the conclusion of the academic year serves as a reflective tool. It offers an opportunity for introspection, allowing individuals to acknowledge their progress and pinpoint areas that warrant further attention. This introspective process facilitates a holistic growth mindset and the formulation of new strategies for ongoing development.

By adopting a data-driven methodology, educators are empowered to make informed decisions regarding program refinements and enhancements. Thus, the developed SEL skills assessment tool is significant for empowering educators to create an evidence-based educational environment.

5.1.1.4. Monitoring Students' SEL Skills for Success in Various Aspects of Life. SEL warrants serious, persistent attention throughout K–12 schooling since it is essential to students' long-term performance in and out of the classroom (Bridgeland *et al.*, 2013; DePaoli *et al.*, 2017; Weissberg *et al.*, 2015). The developed SEL skills scale is expected to provide valuable insights into students' social and emotional abilities, support evidence-based practices, foster accountability, and enable diligent monitoring.

Five fundamental clusters of social and emotional competences have been identified by Roger Weissberg and colleagues (2015): self-awareness, self-management, social awareness, interpersonal skills, and ethical decision-making. These skills are believed to help pupils achieve academically and socially throughout their time in school, to decrease problematic behaviors and mental distress, and to better prepare them for success in college, the workforce, families, and society (Elias, 2014; Jones and Kahn, 2017). The standardized SEL skills scale focuses on assessing all these skills and contributes to students' overall growth.

5.1.1.5. Improvement in Academic and Cognitive Capacities. Numerous studies confirm the vital role of social and emotional foundations in academic success (Greenberg *et al.*, 2003; Hawkins *et al.*, 2008; Jones *et al.*, 2011; Zins *et al.*, 2004). Greenberg *et al.*

(2003) advocated for schools to embrace a broader mission, emphasizing qualities like responsibility, compassion, maturity, and social competence. Recognizing the value of SEL skills within schools, Elias and Haynes (2008) argued that a strong grasp of social and emotional understanding empowers students to build positive relationships and manage emotions, enhancing academic focus.

The impact of SEL skills extends to the domains of math and science education. Numerous theoretical perspectives and related research on social and emotional development hold significance in this context. These perspectives encompass sharing ideas, taking risks, and engaging in hands-on learning (Ottmar, Rimm-Kaufman, Larsen, and Berry, 2015). The developed SEL skills scale contributes by assessing and improving these facets, offering a comprehensive grasp of the current level. The scale aids in designing targeted SEL curricula, benefiting not only SEL skills education but also math and science education for middle school students.

5.2. Limitations of the Study

The current study, similar to many others, has certain limitations that need to be acknowledged. One limitation is related to the cultural diversity of the participants. Due to economic constraints, it was not feasible to include participants from different cultures or countries, despite utilizing a convenient sampling technique. Additionally, because 7th and 8th graders are typically occupied with preparations for national exams, it was impractical to use the scale with these groups. Therefore, the scale was administered to 5th and 6th graders (aged 10-12), even though it's labeled as a scale for middle school students. As a result, the findings may have limited generalizability to populations with diverse cultural backgrounds.

Another limitation pertains to the implementation time of the scale. Given the practical constraints within school settings, the scale was designed to be administered in a single session. While this approach allowed for efficient data collection, it may have limited the depth of assessment.

Additionally, in developing the scale, a decision was made to exclude the cognitive dimension, one of the major dimensions outlined in the Taxonomy Project's SEL Framework. This decision was made to streamline the assessment process and ensure its feasibility within the available resources. However, by excluding the cognitive dimension, the scale may not fully capture the holistic nature of SEL skills and their interplay with cognitive abilities.

Furthermore, the study solely relied on self-report measures from children, which could introduce limitations associated with self-report bias and the potential inability of children to accurately assess their own SEL skills. In the context of the current study, it is essential to recognize the limitation: the exclusion of multi-informant perspectives, such as assessments from parents and teachers, or the utilization of different assessment tool formats may hinder the attainment of a more comprehensive evaluation of students' SEL skills.

One other limitation that the current study faced with was about the sample and participants. As mentioned at the methodology part, the original intention was to ensure a balanced representation of 5th and 6th grade students from both private and public schools in Istanbul, Turkey. However, practical constraints resulted in the collection of sample data being restricted solely to public schools. This limitation emerged in the aftermath of a devastating earthquake that struck southern Turkey on February 6, 2023. Subsequently, most private schools made a commitment to offer extensive counseling courses to support the well-being of their students. This commitment made it unfeasible to administer the scale during a standard lesson hour, as originally planned.

5.3. Suggestions for Further Research

The significance of the current study lies in its provision of a coherent assessment tool for the field. This contribution serves to assist schools in devising appropriate SEL programs rooted in evidence-based education. The impact extends to students, encompassing diverse aspects of their lives. This influence is not restricted to the

augmentation of SEL skills; it also encompasses improvements in academic performance and cognitive abilities. Nevertheless, like all research studies, this study also possesses limitations and areas that can be improved. Hence, there is an opportunity to enhance this study by considering a range of valuable research recommendations.

Firstly, it is recommended to include the cognitive dimension, which was excluded in the current study, as part of the Taxonomy framework. Due to the mentioned limitations, the current tool involved 5 main dimensions of the Taxonomy Framework. To decrease the number of items, the cognitive domain is excluded with the belief of it could be assessed even through several academic measurement tools, too. Although, the developed SEL skills assessment tool provides a standardized aspect for assessing middle school students' SEL skills, improving the scale to assess it totally in line with the Taxonomy project's framework through involving the cognitive domain and investigating the possibility of merging both scales into a more comprehensive approach would bring substantial benefits to the field of study.

Another important suggestion is to diversify the assessment tool types used in further research. The developed SEL skills assessment tool provides a great base for different stakeholders like educators, parents and students. This paved a way for various improvements like having evidence based SEL skills practices and planning more enhanced SEL curriculums. To improve the current study and so the SEL skills scale, it is suggested that instead of relying solely on self-report assessments, involving various sources such as parents, tutors, role-models, and teachers could offer a broader perspective, leading to more generalizable findings may increase the validity of the results.

The other suggestion is to consider cultural inclusion when adapting the scale for different cultures and languages. The current study is applied in Turkish schools in Turkish language. Since the Taxonomy framework is the synthesis of commonly used international SEL frameworks and it is a standardized inclusive framework, it gave a way for the developed SEL skills scale to be a standardized tool in the field.

However, while aiming for a standardized international assessment tool, it is imperative to acknowledge that each culture and language possesses its own specific SEL related issues. Therefore, adapting the scale in a culturally specific manner would be highly advantageous for the field, ensuring the relevance and accuracy of the research outcomes.

Considering the significant outcomes of the ongoing study, particularly the emergence of the SEL skills scale, and its potential positive effects on educational institutions, educators, and students, it becomes evident that substantial stride advancement has been achieved. With the incorporation of suggested improvements and the resulting progress in the field, the study's impact can be described as a substantial contribution to the broader progression of research and practical application in the domain of social and emotional learning.

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APPENDIX A: ANNEXES

Table A.1. Comprehensive frameworks in the Taxonomy Project.

Framework Name	**Age Range**	**Setting**	**Learning Progression**	**Link**
21st Century Learning	Not specified	Schools, other	No	http://exploresel.gse.harvard.edu/frameworks/3/
ACT Holistic Framework	Kinder-garten to career	School, college, workplace	Yes	http://exploresel.gse.harvard.edu/frameworks/41/
Big Five Personality Traits	All ages	Not Specified	No	http://exploresel.gse.harvard.edu/frameworks/7/
Building Blocks for Learning	Grades K-12	School	Yes	http://exploresel.gse.harvard.edu/frameworks/42/
CASEL	Grades PreK-12	School, home, other	No	http://exploresel.gse.harvard.edu/frameworks/1/
Character Lab	Grades K-12	School	No	http://exploresel.gse.harvard.edu/frameworks/32/
Clover Model	Infancy through adulthood	School, out-of-school time (OST)	Yes	http://exploresel.gse.harvard.edu/frameworks/85/
Develop-mental Assets (ages 12-18)	Ages 12-18	School, home, community, out-of-school time (OST)	Yes	http://exploresel.gse.harvard.edu/frameworks/84/

Table A.1. Comprehensive Frameworks in the Taxonomy Project. (cont.)

Framework Name	**Age Range**	**Setting**	**Learning Progression**	**Link**
EDC Work Ready Now! Framework	Ages 15-30	School, non-formal education, crisis and conflict	No	http://exploresel.gse.harvard.edu/frameworks /79/
EU NESET Framework for Social and Emotional Education	Early Childhood, school age child, adolescent	School	No	http://exploresel.gse.harvard.edu/frameworks/45/
Emotional Intelligence	Infant to adult	School, home, workplace, ather	Yes	http://exploresel.gse.harvard.edu/frameworks/4/
Employability	Not specified	School, workplace, other	No	http://exploresel.gse.harvard.edu/frameworks/35/
Habits of Mind	Not specified	School	No	http://exploresel.gse.harvard.edu/frameworks/67/
Head Start	Ages 0-5	Early childhood settings	Yes	http://exploresel.gse.harvard.edu/frameworks/36/
Hilton and Pellegrino Clusters of 21st Century Competencies	Grades K-12	School	No	http://exploresel.gse.harvard.edu/frameworks/9/
IB Learner Profile	Early childhood, school age child, adolescent, yong adult	School	No	http://exploresel.gse.harvard.edu/frameworks/61/

Table A.1. Comprehensive Frameworks in the Taxonomy Project. (cont.)

Framework Name	**Age Range**	**Setting**	**Learning Progression**	**Link**
IRC Social and Emotional Learning Competencies	School age child	Emergency /conflict	No	http://exploresel.gse.harvard.edu/frameworks/80/
K-12 SEL Standards (Anchorage)	Grades K-12	School	Yes	http://exploresel.gse.harvard.edu/frameworks/29/
K-3 SEL Standards (Connecticut)	Grades K-3	School	Yes	http://exploresel.gse.harvard.edu/frameworks/25/
KIPP	Grades K-12	School	No	http://exploresel.gse.harvard.edu/frameworks/37/
Kenya BECF Core Competencies for Basic Education	Ages Nis.18	School	No	http://exploresel.gse.harvard.edu/frameworks/57/
Kenya TVET Values and Life Skills (VaLI) Framework	15-25 years	Workplace	No	http://exploresel.gse.harvard.edu/frameworks/81/
LEGO's Skills for Holistic Development	Early childhood, scholl age child	School, community, home	No	http://exploresel.gse.harvard.edu/frameworks/62/
MELOO MODEL Framework	Early childhood, school age child	School.home, community, non-formal education	No	http://exploresel.gse.harvard.edu/frameworks/55/

Table A.1. Comprehensive Frameworks in the Taxonomy Project. (cont.)

Framework Name	**Age Range**	**Setting**	**Learning Progression**	**Link**
MESH	Grades K-12	School	No	http://exploresel.gse.harvard.edu/frameworks/40/
OECD	Primary and secondary school	School	No	http://exploresel.gse.harvard.edu/frameworks/43/
Pratham Life Skills Framework	Adolescents and adults	School, Community, non-formal/ informal education	No	http://exploresel.gse.harvard.edu/frameworks/77/
Preparing Youth to Thrive	Age 5-18	Out-of-school time (OST)	No	http://exploresel.gse.harvard.edu/frameworks/69/
Room to Read Life Skills Education Learning Outcomes	Adolescent	School	Yes	http://exploresel.gse.harvard.edu/frameworks/51/
Sesame Workshop Global Framework for Learning	Early childhood	Non-formal education, home, community, crisis and conflict	Yes	http://exploresel.gse.harvard.edu/frameworks/59/
Singapore Framework for 21CC and Student Outcomes	Primary through pre-University	School	No	http://exploresel.gse.harvard.edu/frameworks/56/

Table A.1. Comprehensive Frameworks in the Taxonomy Project. (cont.)

Framework Name	**Age Range**	**Setting**	**Learning Progression**	**Link**
Social, Emotional, and Ethical (SEE) Learning Framework	K-12, higher, and professionel education	School	No	http://exploresel.gse.harvard.edu/frameworks/78/
The Five Cs Model of Positive Youth Development	Adolescent	Home, school, community, out-of-school time (OST)	No	http://exploresel.gse.harvard.edu/frameworks/52/
The PRACTICE Model	Ages 0-29	School, home, community, workplace	Yes	http://exploresel.gse.harvard.edu/frameworks/49/
UNICEF India Comprehensive Life Skills Framework	Early childhood, school age child, adolescent, young adult	School, non-formal/ informal, community, workplace, crisis and conflict	No	http://exploresel.gse.harvard.edu/frameworks/63/
UNICEF MENA Life Skills and Citizenship Education-Conceptual and Programmatic Framework	Children, youth, and all learners	School. non-formal/ informal education, workplace	No	http://exploresel.gse.harvard.edu/frameworks/47/

Table A.1. Comprehensive Frameworks in the Taxonomy Project. (cont.)

Framework Name	**Age Range**	**Setting**	**Learning Progression**	**Link**
USAID Youth Power Action Key Soft Skills for Cross-Sectoral Youth Outcomes	Ages 1229	Non-formal education, community, workplace	No	http://exploresel.gse.harvard.edu/frameworks/53/
Vision of the Haitian Child in Society: Social Emotional Framework	Pre-primary to post-secondary	School	No	http://exploresel.gse.harvard.edu/frameworks/60/
WHO Skills for Health	Preschool through early adulthood	School	No	http://exploresel.gse.harvard.edu/frameworks/58/
Young Adult Success	Ages 3-22	School, home, out-of-school time (OST)	Yes	http://exploresel.gse.harvard.edu/frameworks/2/

Table A.2. Examples of item modifications at each stage.

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Emotional Knowledge and Expression	Expresses emotions to others in effective ways (e.g., Uses "I messages")	I express my emotions to other people effectively (e.g., friends, family, teachers)	Çevremdeki kişilere (ailem, arkadaşlarım, öğretmenlerim vb.) duygularımı etkili bir şekilde ifade ederim.	Çevremdeki insanlara duygularımı ifade ederim.
Emotional Knowledge And Expression	Identifies emotions in self or others	I identify my own and other people's emotions easily	Kendimin ve diğer kişilerin (ailem, arkadaşlarım, öğretmenlerim vb.) duygularını kolaylıkla fark eder ve tanımlarım.	Duygularımın farkındayımdır.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Emotional Knowledge and Expression	Understands Relationships Between situation and emotion (e.g., accurately identifies the emotion a particular situation would elicit)	I understand how the situation and emotions are interconnected (my friend is joyful we are celebrating her/his birthday in class, I understand that everybody feels excited because we all go to a school trip)	Olayların ve duyguların birbiriyle ilişkili olduğunu anlarım. Örneğin, okul gezisine gideceğimiz zaman sınıf arkadaşlarımın bu sebeple heyecanlı hissettiğini anlarım.	Durum ve duygular Arasındaki ilişkiyi anlarım. Örneğin, okul gezisine gidildiği için heyecanlı olunmasını veya başarısızlık karşısında hayal kırıklığı yaşayan arkadaşımın duygusunu anlarım.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Emotional and Behavioral Regulation	Uses effective Regulatory strategies when upset (e.g., self talk, taking deep breaths, walking away, Stop and Stay Cool, etc.)	I use effective regulatory strategies when I am upset, disappointment or feel failure (e.g., self-talk, taking deep breaths, walking away, Stop and Stay Cool, etc.)	Üzgün, hayal kırıklığına uğramış ya da başarısızlık hissettiğim anlarda duygularımı yönetmek için etkin yöntemler kullanırım (Ör: kendimle konuşurum, derin nefes alırım, yürüyüşe çıkarım, sakin kalmayı denerim).	Üzgün Hissettiğim anlarda duygularımı yönetmek için; yatıştırıcı konuşma yapmak, derin nefes almak, uzaklaşmak ve sakin kalmaya çalışmak gibi yöntemler kullanırım.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Emotional and Behavioral Regulation	Uses feeling words to explain one's behavior	I use Feeling words to explain my friends' or family's behavior (If I am angry on a behavior of my friend, I express Myself to him/her mentioning how I feel, like being sad)	Çevremdeki Kişilerin (ailem, arkadaşlarım, öğretmenlerim vb.) davranışlarını açıklamak için bana nasıl hissettirdiğini belirtirim (Ör: "Beni çağırmadan gitmen bana önemsiz hissettirdi ve üzdü").	Çevremdeki kişilerin davranışlarının bana hissettirdiklerini açıklamak için duygu sözcükleri kullanırım. Örneğin üzüntümü arkadaşıma açıklarken "Bana haber vermeden sinemaya gitmen beni üzdü". şeklinde belirtirim.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Emotional and Behavioral Regulation	Can regulate one's emotions (including anxiety, anger, and other emotions)	I can regulate my emotions (including anxiety, anger, and other emotions)	Kaygı, sinir vb. duygular dahil farklı duygularımı düzenleyebilir ve kontrol edebilirim.	Kaygı ve öfke gibi duygularımı kontrol edebilirim.
Empathy / Perspective Taking	Identifies and acknowledges the experiences, feelings, and viewpoints of others (including characters)	I identify and acknowledge the experiences, feelings, and viewpoints of others (including characters)	Çevremdeki kişilerin (ailem, arkadaşlarım, öğretmenlerim vb.) duygularının, deneyimlerinin, farklı bakış açıları ve karakterlerinin farkında olur ve kabul ederim.	Çevremdeki kişilerin duygularının ve farklı bakış açılarının farkındayımdır.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Empathy / Perspective Taking	Identifies and acknowledges how another's feelings differ from one's own (including characters)	I identify and acknowledge how other people's (my family, friends, teachers') feelings differ from my own feelings (including characters)	Çevremdeki Kişilerin (ailem, arkadaşlarım, öğretmenlerim vb.) duygularının benim duygularımdan nasıl farklılaştığını tanımlar ve bu farklılığı kabul ederim.	Çevremdeki kişilerin duygularının benim duygularımdan farklı olabileceğini kabul ederim.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Empathy / Perspective Taking	Uses physical gestures or verbal expressions to comfort or provide relief to another person in distress (e.g., hugs, pats, expressing concern, verbal sympathy)	I use physical gestures or verbal expressions to comfort or provide relief to another person in distress (e.g., hugs, pats, expressing concern, verbal sympathy)	Bir arkadaşım sıkıntılı olduğunda ona iyi geleceğine inandığım sözler ve jest/mimikler sergilerim (Ör: sarılırım, hafifçe dokunurum, kaygımı ifade ederim, sempatik konuşmalar yaparım).	Bir arkadaşım sıkıntılı olduğunda ona iyi gelebilecek ifadeler ve jest/mimikler kullanırım. Örneğin, sarılırım, omuzuna dokunurum, onu önemsediğimi ifade ederim, sempatimi gösteren konuşma yaparım.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Unders-tanding Social Cues	Uses social cues such as body language and tone of voice in standard and appropriate ways (refers to self)	I use social cues such as body language and tone of voice in standard and appropriate ways (refers to self)	Sosyal bir ortamda kendimi ifade ederken vücut dili ve ses tonu gibi ifade biçimlerine de başvururum.	Kendimi ifade ederken uygun beden dili ve ses tonu gibi iletişim yollarını kullanırım.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Unders-tanding Social Cues	Accurately Interpreting and appropriately responding to others' social cues such as body language and tone of voice (refers to others, including characters)	I accurately interpret and appropriately respond to my friends' and family's social cues such as body language and tone of voice (refers to others, including characters)	Çevremdeki kişilerin (ailem, arkadaşlarım, öğretmenlerim vb.) vücut dili ve ses tonunu doğru bir şekilde yorumlar ve anlamlandırırım.	Cevremdeki kisilerin beden dili ve ses tonu gibi iletisim yollarını anlamlan-dırabilirim. Ornegin, bir arkadasımın beden dilinden ofkeli oldugunu anlarım.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Unders-tanding Social Cues	Identifies motivations and intentions of others (including when others' actions are accidental or purposeful/ hostile)	I identify motivations and intentions of my friends and family members (including when others' actions are accidental or purposeful/ hostile)	Çevremdeki Kişilerin (ailem, arkadaşlarım, öğretmenlerim vb.) niyetlerini ve motivasyonlarını davranışlarına göre tanımlayabilirim.	Çevremdeki kişilerin niyetlerini anlarım. Örneğin bir kişinin bir davranışını kazayla mı, bilerek mi sergilediğini anlarım.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Conflict Resolution / Social Problem Solving	Faces conflicts and deals with them in constructive ways (e.g., win-win, compromising) (including situations involving characters)	I face conflicts and deal with them in constructive ways (If I have a conflict with a friend, I try to solve it in a way that both of us will be happy at the end and will get an advantage) (including situations involving characters)	Zorluklarla karşılaşır ve onları yapılandırmacı bir şekilde çözerim (Ör: Arkadaşımla yaşadığım bir sorunda ikimize de iyi gelecek bir çözümde sonlanmaya özen gösteririm.).	Çatışmaları yapıcı bir şekilde çözerim. Örneğin arkadaşımla yaşadığım bir çatışmayı ikimizin de kabul edebileceği bir çözümle sonlandırmaya özen gösteririm.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Conflict Resolution / Social Problem Solving	Understands that conflict and disagreement are normal parts of life but how one handles them is important	I understand that conflict and disagreement are normal parts of life and the important thing is about how I handle them.	Çelişki ve zıtlıkların da hayatın bir parçası olduğunu ve normalliğini anlar; önemli olanın onlarla nasıl başettiğim olduğunu bilirim.	Anlaşmaz-lıkların hayatın normal bir parçası olduğunu bilirim.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Conflict Resolution / Social Problem Solving	Asserts oneself in an appropriate manner during a conflict (e.g., uses I messages, calmly and diplomatically states values and preferences, etc.)	During a conflict, I assert myself in an appropriate manner like using I messages, Calmly and diplomatically stating values and preferences, etc.	Bir tartışma sırasında kendimi uygun bir şekilde ifade ederim . Örneğin; "ben" dili kullanır, sakin olmaya çalışırım, değer ve tercihlere saygılı davranmaya çabalarım.	Anlaşmazlıklar Sırasında kendimi uygun bir şekilde ifade ederim. Ornegin, anlasmazlıgı ortadan kaldırmak icin davranıslarımın ve tercihlerimin ardında yatan sebepleri ben dili kullanarak acıklarım.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Prosocial / Cooperative Behavior	Effectively enters and engages in a variety of social situations	I effectively enter and engage in a variety of social situations	Birçok sosyal ortamda etkili bir şekild e dahil olur ve aktif olarak yer alırım.	Farklı sosyal ortamlara aktif bir şekilde dahil olurum.
Prosocial / Cooperative Behavior	Acts respectfully and kindly toward others	I act respectfully and kindly towardmy friends and teachers	Çevremdeki kişilere (ailem, arkadaşlarım, öğretmenlerim vb.) kibar ve saygılı davranırım.	Çevremdeki kişilere saygılı davranırım.
Prosocial / Cooperative Behavior	Works as a team to achieve a goal (doing something together)	I work as a team to achieve a goal (doing Something together)	Grup çalışmalarında beraber üretmek ve takım olarak birlikte başarmak için çalışırım.	Bir hedefe ulaşmak için arkadaşlarımla birlikte çalışabilirim.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Prosocial / Cooperative Behavior	Builds and maintains positive relationships	I build and maintain positive relationships	Pozitif ilişkiler kurur ve sürdürürüm.	Çevremdekilerle olumlu ilişkiler kurarım.
Ethical Values	Expresses care/shows consideration for the feelings of others (e.g., sympathy, compassion)	I express care and show consideration for the feelings of my friends like sympathy and compassion	Çevremdeki kişilerin (ailem, arkadaşlarım, öğretmenlerim vb.) duygularına dikkat eder ve özen gösteririm.	Çevremdeki kişilerin duygularını önemserim.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Ethical Values	Understands the importance of treating others with courtesy (e.g., polite, respectful, demonstrates good sportsmanship)	I understand the importance of treating my friends with courtesy in a polite and respectful way.	Arkadaşlarıma kibar ve saygılı bir şekilde davranmanın önemini anlarım.	Çevremdeki kişilere nazik bir şekilde davranmanın önemini bilirim.
Ethical Values	Conducts self with honesty and integrity (e.g., tells the truth, admits wrong-doing, doesn't cheat or steal)	I conduct Myself with honesty and integrity through telling the truth and not cheating or stealing.	Kopya çekmek, yalan söylemek gibi davranışlardan kaçınarak dürüstlük ve bütünlük içinde davranmak için kendimi yönetirim.	Hile veya düzenbazlığa başvurmadan, dürüstçe hareket ederim.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Performance Values	Tries one's best in challenging situations or in spite of difficulty, delay, or boredom (e.g., perseveres, does not easily give up)	I try my best in challenging situations or in spite of difficulty, delay, or boredom. That's, I don't easily give up in a challenging situation.	Zorluk, sıkıntı ve/veya gecikme durumları gibi zorlu anlarda elimden geleni yapmaya çabalarım ve kolay kolay pes etmem.	Zorlayıcı durumlarla karşılaştığımda elimden geleni yapmaya çalışırım.
Perfor-mance Values	Sets one or more tasks/goals and shows motivation or passion to complete them; is determined	I am determined. I set one or more tasks/goals and show motivation or passion to complete them.	Belirlediğim hedefleri gerçekleştirmek için motivasyon ve tutkuyla ilerleyen kararlı biriyim.	Belirlediğim hedefleri gerçekleştirmek için kararlılıkla ilerlerim.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Perfor-mance Values	Demonstrates good organizationa l skills (e.g., plans ahead, Manages time wisely, arrives to class prepared, etc.)	I demonstrate good organizational skills like planning ahead, managing time wisely and arriving to class prepared.	Geleceğe yönelik planlama, bilinçli zaman yönetimi, sınıfa hazır bir şekilde ulaşmak gibi organizasyonel becerilerim güçlüdür.	Planlama ve etkili zaman yönetimi gibi organizasyonel becerilerim iyidir.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Civic Values	Understands one's connection and responsibility to family, classroom, school community, neighborhood, country, and world; understands the value of civic responsibility	I understand the value of civic responsibility and I am aware of my connection and responsibility to my family, classroom, school community, neighborhood, country, and world.	Vatandaşlık sorumluluğumun ve ailem, arkadaşlarım, yaşadığım yerdeki vatandaşlarla olan bağım ve sorumluluklarımın farkındayım.	Çevrem-dekilere karşı sorumlu-luklarımın farkındayım.
Civic Values	Volunteers to help when needed	I volunteer to help when needed	Gerekli olduğu zaman yarım etmek için gönüllü olurum.	Yardım gereken durumlarda yardım etmek için gönüllü olurum.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Civic Values	Understands the importance of setting a good example for others and acting as a positive influence	I understand the importance of setting a good example for my friends and acting as a positive influence	Arkadaşlarım için iyi bir örnek olmak ve pozitif bir etki yaratmanın öneminin bilincindeyim.	Arkadaşlarım için iyi bir örnek olmanın öneminin farkındayım.
Intellectual Values	Expresses an eagerness to know and learn new things (e.g., is curious)	I express an eagerness to know and learn new things. I can define myself as a curious individual.	Kendimi meraklı bir birey olarak tanımlayabilir ve yeni bir şeyler öğrenmeye/ bilmeye heyecan duyarım.	Yeni bir şeyler öğrenmeye karşı heyecan duyan, meraklı birisiyim.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Intellectual Values	Seeks out New information and learns new skills on one's own	I seek out new information and learn new skills on my own	Yeni Bilgileri araştırır ve kendi kendime yeni beceriler öğrenirim.	Kendi kendime araştırarak yeni beceriler edinirim.
Intellectual Values	Thinks outside the box; approaches tasks and problems in novel ways (e.g., is creative)	I define myself as a creative individual because I think outside the box and approach problems in novel ways.	Problem durumlarına yenilikçi çözümler ürettiğim ve farklı çözümler sunduğum için kendimi yaratıcı bir birey olarak tanımlayabilirim.	Kendimi, problem durumlarında yenilikçi ve farklı çözümler sunan bir birey olarak tanımlarım.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Optimism	Expresses optimism and/ or maintains optimistic outlook	I express optimism and/or maintain optimistic outlook	İyimser davranır ve iyimser bakış açısını sürdürürüm.	İyimser davranırım.
Optimism	Expects good things to happen	I expect good things to happen	İyi şeyler olmasını ümit ederim.	İyi şeyler olmasını ümit ederim.
Optimism	Approaches and reflects on challenging situations with a positive attitude	I approach and reflect on challenging situations with a positive attitude	Zorlu durumlara pozitif bir şekilde yaklaşırım.	Zorlu durumlara olumlu bir şekilde yaklaşırım.
Gratitude	Expresses gratitude and appreciation for good and/or everyday things	I express gratitude and appreciation for good and/or everyday things	Hayatımdaki gündelik konu ve olaylara da minnet ve şükran gösteririm.	Hayatımda iyi giden olaylara minnet ve şükran duyarım.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Gratitude	-	-	-	Çevremdeki kişilere minnet ve şükran duyarım.
Gratitude	-	-	-	Yaşamımda sahip olduklarıma şükran duyarım.
Openness	Adapts willingly and easily to change, both positive and negative	I adapt willingly and easily to change, both positive and negative ways.	Değişime ve yeniliklere adapte olmaya gönülden açığımdır.	Olumlu ya da olumsuz olaylara karşı kolayca ve isteyerek uyum gösteririm.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Openness	Receptive to new and unfamiliar ideas, feelings, and experiences	I am receptive to new and unfamiliar ideas, feelings, and experiences	Alışık olmadığım ve yeni karşılaştığım fikir, deneyim ve duygulara hızlı adapte olurum.	Alışık olmadığım, ilk kez karşılaştığım deneyim ve duygulara hızlı adapte olurum.
Openness	Interested in and open to whatever is in the present moment	I am interested in and open to whatever is in the present moment	Bulunduğum anda olanlarla ilgilenirim (Ör: Arkadaşlarımla yemek yerken, 3 gün sonra ne yapacağımı düşünmeye değil o andan keyif almaya odaklanırım.).	Bulunduğum anda olanlara odaklanırım. Örneğin, arkadaşlarımla yemek yerken, 3 gün sonra ne yapacağımı düşünmeye değil o andan keyif almaya odaklanırım.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Enthusiasm / Zest	Approaches activities with enthusiasm and excitement	I manage tasks by showing enthusiasm	Görevlerimi/ ödevlerimi hevesle planlarım.	Görev ve sorumlu-luklarımı motive bir şekilde yaparım.
Enthusiasm / Zest	-	-	-	Ödevlerimi motive bir şekilde yaparım.
Self-Knowledge	Recognizes and understands one's own strengths and weaknesses	I recognize and understand my own strengths and weaknesses	Kendi güçlü ve gelişime açık yanlarımın farkındayım.	Güçlü ve gelişime açık yanlarımın farkındayım.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Self-Knowledge	Develop and maintain a coherent sense of self and roles over time	I develop and maintain a coherent sense of self and roles over time	Zaman içinde kendime ve çevreme uyumlu bir benlik geliştirir ve sürdürürüm.	Kendi icinde tutarlı bir kisilik ve roller gelistiririm. Örnegin, durust biri olmaya cabalıyorsam bu kisilik ozelligimi hem ogrenci rolum, hem cocuk rolum hem de arkadas rolumde sergilerim.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Self-Knowledge	Identifies and understands one's interests and preferences	I identify and understand my interests and preferences	İlgilerimi ve tercihlerimi anlar ve tanımlarım.	İlgi alanlarımı ve tercihlerimi bilirim.
Purpose	Imagines the future; formulates life goals and ways to pursue them	I imagine the future; formulate life goals and ways to pursue them	Geleceği hayal eder, hayatıma dair hedefler belirler ve o yolda ilerlerim.	Hayal ettiğim geleceğe yönelik hedefler yolunda ilerlerim.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Purpose	Considers existential questions (e.g., what is the purpose of my life, what is my life passion, what is happiness, what is my place in the world, etc.)	I make future plans for myself and explore the meaning of life accordingly.	Kendim için gelecek planları yapar ve ilişkili olarak hayatın amacını keşfederim.	Hayatın amacını kendim için gelecek planları yaparak belirlerim.
Purpose	-	-	-	Hayatıma dair belirlediğim amaçlar için çalışırım.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Self-Efficacy / Growth Mindset	Believes that intellectual abilities and personality traits are qualities that can be developed and improved	I believe that intellectual abilities and personality traits are qualities that can be developed and improved	Entelektüel beceriler ve kişilik özelliklerinin geliştirilebilir değerler olduğuna inanırım.	Entelektüel beceriler ve kişilik özelliklerinin geliştirilebilir olduğuna inanırım.
Self-Efficacy / Growth Mindset	Expresses Confidence in oneself and one's ability to improve or succeed	I express confidence in myself and my ability to improve or succeed	Kendime güvenir, gelişmek ve başarmak için becerilerime inanırım.	Gelişmek ve başarmak için kendime güvenirim.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Self-Efficacy / Growth Mindset	Sees challenges as things that one can take on and overcome with time and effort	I see challenges as things that I can take on and overcome with time and effort	Zorlukları, yeterli zaman ve çaba ile üstesinden gelebileceğim şeyler olarak görürüm.	Zorlukları, yeterli zaman ve çaba ile üstesinden gelebileceğim şeyler olarak görürüm.
Self-Efficacy / Growth Mindset	Belief that one has a choice (agency)	I believe that I have a choice (agency) in almost every situation.	Seçim yapma ve bu seçimleri hayatımda uygulama becerim olduğuna inanırım.	Gündelik Hayatta seçim yapma özgürlüğün e sahip olduğuma inanırım.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Self-Esteem	Feels a sense of belonging; feels valued by others in the community	I feel a sense of belonging; feel valued by others in the community.	Bulunduğum sosyal çevrede başkaları tarafımdan değer gördüğümü hissederim ve bu çevreye aidiyet hissine sahibim.	Sosyal çevrede başkaları tarafından değer gördüğümü hissederim.
Self-Esteem	Extends kindness and understanding to oneself (e.g., has self-compassion, emotional self-respect, etc.)	I extend kindness and understanding to myself through having self-compassion and emotional self-respect.	Öz saygı ve öz merhametim olduğu için kendime ince ve anlayışlı davrandığıma inanıyorum.	Kendime nazik ve anlayışlı davranırım.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Self-Esteem	Forgives oneself for errors and mistakes (e.g., accepts and moves on from past actions)	I forgive myself for errors and mistakes, accept and move on from past actions.	Hata yaptığım zaman kendimi affeder, bunu kabullenir ve geçmiş olaydan çıkarak devam edebilirim.	Geçmişte yaptıklarımı geride bırakarak yoluma devam ederim.

Table A.2. Examples of item Modifications at Each Stage. (cont.)

Sub-dimension	**The item sourced from the Taxonomy project's outcome**	**The modified version of the item intended for inclusion in the scale.**	**The version of the item modified to align with the l anguage compre-hension level of middle school students.**	**The translated and validated version of the item in Turkish, ensuring its suitability for the scale.**
Self-Esteem	Understands the effects of risk behaviors (e.g., drugs, alcohol, tobacco, sex, etc.) on their body and uses that information to make responsible choices	I understand the effects of risk behaviors like chemicals' use on my body and use that information to make responsible choices.	Kimyasal kullanımı gibi riskli davranışların vücuduma olan etkilerini bilirim ve seçimlerimi bu bilinçle yaparım.	Tehlikeli ve zararlı madde kullanımı gibi riskli davranışların bedenime olan etkilerini bilerek sorumlu karar veririm. Ornegin, teklif edilen zararlı maddeyi geri ceviririm.

Table A.3. Item list, 6 dimensions derived from the Taxonomy Project.

Cognitive	**Attention control**	Sustains attention by focusing on task at hand Uses strategies to maintain attention (e.g., uses self-talk to keep focused) Uses listening skills to focus (e.g., looks at speaker, sits still, puts hands in lap, doesn't talk) Ignores distractions when doing a task
	Working Memory and Planning Skills	Uses strategies to make a plan (independently or under the direction of a teacher) Carries out complex tasks (e.g., completing multi-step tasks, thinking through options and choosing one, etc.) Engages in goal-directed behavior independently and when instructed (i.e. acting to achieve a goal) Remembers and follows complex (e.g., two- and three-part) commands Uses strategies to remember and follow complex (e.g., two- and three-part) commands(e.g. repeating directions out loud or in head, making a list, periodically consulting the directions, etc.)

Table B.6. Item List for the 6 Dimensions Derived, Taxonomy Project. (cont.)

		Remembers and recalls information (e.g., recalls multiple rules during a game, remembers key points from reading, recalls a plan and if it was followed, etc.) Uses strategies to remember and recall information (e.g., self-talk) Sets goals (differs from acting to achieve a goal)
	Inhibitory Control	Inhibits inappropriate responses (e.g. raising hand instead of shouting out answer) Uses strategies to inhibit inappropriate responses (e.g., taking a deep breath, counting to 10, sitting on hands, covering mouth, self talk, covering ears, folding arms, etc.) Waits (e.g. waits turn to play game or talk, waits for teacher to finish giving instructions, stays in seat until time to leave and lines up appropriately without reminding, etc.) Uses strategies to wait (e.g., playing game or singing a song while in line, engaging in other tasks such as reading while waiting for others to finish, self talk) Easily transitions

Table B.6. Item List for the 6 Dimensions Derived, Taxonomy Project. (cont.)

	Cognitive Flexibility	to new tasks Compares and contrasts ideas Generates and updates hypotheses (e.g., consequential thinking: "if X, then Y") Downplays less relevant information when solving problems Approaches problems in flexible ways (e.g., brainstorms multiple solutions to a problem) Uses strategies to transition to new tasks or activities (e.g. song, two-minute warning) Shifts attention from one task, aspect, or perspective to another
	Critical Thinking	Utilizes reason to understand, predict, and/or deduce Asks and answers questions for clarification Defines, interprets and explains terms and/or ideas Plans processes needed to solve a problem Evaluates options for solving a problem Carries out a solution to solve a problem Monitors progress in solving a problem Evaluates progress in solving a problem Systems thinking;

Table B.6. Item List for the 6 Dimensions Derived, Taxonomy Project. (cont.)

		understands the complexity of systems and actors (including how parts interact with the whole) Interprets and draws conclusions Monitors the quality of their thought (e.g. reflection or metacognition) Employs strategies to analyze information, evidence, and/or arguments (including assessing assumptions, separating fact from opinion, questioning validity, verifying information, and/or listening and observing) Recognizes multiple sides of an issue and/or understands multiple perspectives Processes information efficiently Identifies and understands the existence and nature of problems Demonstrates motivation and/or dispositions conducive to critical thinking (including open-mindedness, fair-mindedness, inquisitiveness, flexibility, and/or respect for others' viewpoints)

Table B.6. Item List for the 6 Dimensions Derived, Taxonomy Project. (cont.)

		Employs problem- solving process to make a decision (code if stress is on selecting a solution) Reflects on past thoughts and actions
Emotion	**Emotional Knowledge and Expression**	Uses feeling words appropriate to the situation Appropriately uses a range of feeling words of varying intensity (e.g., I felt angry vs. I felt furious) Expresses emotions to others in effective ways (e.g., Uses "I messages") Identifies emotions in self or others Identifies intensity of emotions/ feelings in self and others Differentiates between feelings and behaviors (e.g., I feel angry vs. I feel like hitting you) Understands relationships between situation and emotion (e.g., accurately identifies the emotion a particular situation would elicit) Understands complex/ simultaneous feelings (e.g., being nervous and excited at the same time) Is able to monitor and predict emotions

Table B.6. Item List for the 6 Dimensions Derived, Taxonomy Project. (cont.)

	Emotional and Behavioral Regulation	Uses effective regulatory strategies when upset (e.g., self talk, taking deep breaths, walking away, Stop and Stay Cool, etc.) Uses feeling words to explain one's behavior Identifies and communicates how a problem or challenge makes one feel Can regulate one's emotions (including anxiety, anger, and other emotions) Utilizes effective strategies to cope with disappointment and failure Understands what constitutes appropriate vs. inappropriate expressions of emotion and expresses oneself appropriately
	Empathy/Perspective Taking	Identifies and acknowledges the experiences, feelings, and viewpoints of others (including characters) Offers examples of times when one had similar emotions or experiences (including characters) Uses active interpersonal listening strategies to

Table B.6. Item List for the 6 Dimensions Derived, Taxonomy Project. (cont.)

		elicit and understand the feelings and opinions of others (e.g., asking probing questions, making eye contact, paraphrasing and reflecting, nodding, and leaning forward) Identifies and acknowledges how another's feelings differ from one's own (including characters) Acknowledges how another's point of view and thoughts differ from one's own (including characters) Makes connections (compare and contrast) between self and other (including characters) (e.g., offers examples of times when one had similar emotions or experiences) Demonstrates active role-taking (considering oneself in another's situation) Identifies the relationship between the behaviors/emotions/ situation of one individual and the feelings of another (e.g., Suzy is sad because her mom is sad/sick/crying) Recognizes/lists potential ways to

Table B.6. Item List for the 6 Dimensions Derived, Taxonomy Project. (cont.)

		respond to empathic concern (e.g., asking for help, laughing at a victim, giving verbal reassurance) Identifies which responses to empathic concern are most appropriate and effective (e.g. whether solution was effective, whether all parties are satisfied) Seeks help or comfort from others to deal with distress caused by empathy (verbal and physical) Uses effective self-control strategies to cope with distress caused by empathy (e.g., self talk, deep breaths, etc.) Uses physical gestures or verbal expressions to comfort or provide relief to another person in distress (e.g., hugs, pats, expressing concern, verbal sympathy)
Social	**Understanding Social Cues**	Uses social cues such as body language and tone of voice in standard and appropriate

Table B.6. Item List for the 6 Dimensions Derived, Taxonomy Project. (cont.)

		ways (refers to self) Accurately interpreting and appropriately responding to others' social cues such as body language and tone of voice (refers to others, including characters) Identifies motivations and intentions of others (including when others' actions are accidental or purposeful/hostile)
	Conflict Resolution/ Social Problem Solving	Faces conflicts and deals with them in constructive ways (e.g., win-win, compromising) (including situations involving characters) After conflict, reflects appropriately on its outcome(s) (including situations involving characters) Uses strategies to effectively address or solve social dilemmas and conflicts (e.g., talking to an adult, seeking out mediation, peace path, using "I messages", etc.) Identifies the problem or its antecedents Uses strategies to think about/see the bigger picture

Table B.6. Item List for the 6 Dimensions Derived, Taxonomy Project. (cont.)

		Uses strategies to avoid interpersonal conflicts (including jumping to conclusions, not waiting, interrupting, etc) Understands that conflict and disagreement are normal parts of life but how one handles them is important Generates and evaluates potential responses and their consequences Identifies effective and ineffective outcomes to conflict Asserts oneself in an appropriate manner during a conflict (e.g., uses I messages, calmly and diplomatically states values and preferences, etc.)
	Prosocial/Cooperative Behavior	Effectively enters and engages in a variety of social situations Is inclusive of other children Stands up for other children when they are teased, insulted, or left out Stands one's ground when another child tries to pressure him or her Calmly and diplomatically

Table B.6. Item List for the 6 Dimensions Derived, Taxonomy Project. (cont.)

		states values and preferences (e.g., is assertive in ways appropriate to situation) Listens attentively to others (e.g.,listening to group members, not talking over others) Acts respectfully and kindly toward others Encourages/supports others/team members Follows classroom/ institution/society rules and expectations (norms, directions) and exhibits appropriate behavior for context Participates as an active and successful member of a team/ community Completes one's responsibilities within a team in a timely manner (code only if responsibility within a team is explicit, not regular teamwork) Demonstrates leadership in team tasks Allows others to lead in team tasks Helps others to resolve conflicts/disputes

Table B.6. Item List for the 6 Dimensions Derived, Taxonomy Project. (cont.)

		Identifies and takes action to correct hurtful situations (e.g., apologizes) Gives compliments to others Works as a team to achieve a goal (doing something together) Works as a team to remember and summarize information (thinking together) Takes turns with peers Effectively communicates ideas, stories, and information to others Shares with others (toys, belongings, objects, etc.) Understands the actions and behaviors that foster friendship (e.g., understands what a friend is and how to make and sustain them) Knows how, when, and/or who to ask for help/assistance Seeks help when needed Builds and maintains positive relationships

Table B.6. Item List for the 6 Dimensions Derived, Taxonomy Project. (cont.)

		Understands how one's actions affect others/the community Manages/copes with unfair situations or situations one perceives to be unfair
Values	**Ethical Values**	Expresses care/shows consideration for the feelings of others (e.g., sympathy, compassion) Selflessly offers, gives to, or shares with others (e.g., is generous) Understands the importance of accepting and/or forgiving the shortcomings of others (e.g., is patient, forgiving) Demonstrates a willingness to sacrifice personal gain or comfort for the sake of others (e.g., is altruistic) Believes it is important to be tolerant and accepting of differences in others; or celebrates/appreciates diversity Understands and avoids acting on stereotypes and pre-conceived notions Understands the importance of treating others with

Table B.6. Item List for the 6 Dimensions Derived, Taxonomy Project. (cont.)

		courtesy (e.g., polite, respectful, demonstrates good sportsmanship) Takes care of and treats property with respect (e.g., school facilities, classroom materials, family/friends' belongings) Accepts responsibility for one's words, actions, and attitudes Conducts self with honesty and integrity (e.g., tells the truth, admits wrong-doing, doesn't cheat or steal) Does the right thing in the face of difficulty (e.g., follows conscience instead of the crowd, stands up for one's beliefs, demonstrates courage) Constructs and/or expresses opinions about right and wrong (e.g., makes ethical judgements) Weighs options and considers consequences to make ethical decisions Resists temptation (e.g., recognizes and avoids unsafe, unhealthy, dangerous, or undesirable situations)

Table B.6. Item List for the 6 Dimensions Derived, Taxonomy Project. (cont.)

		Understanding and respecting the intrinsic worth and rights of all people (e.g., belief in human rights/human dignity, equality, etc.)
	Performance Values	Follows through on commitments Tries one's best in Challenging situations or in spite of difficulty, delay, or boredom (e.g., perseveres, does not easily give up) Strives for excellence and takes pride in one's work (e.g., does not do things half-way or half-heartedly) Remains on task and committed to goals in the face of distractions or temptations (e.g., completes homework before watching TV); is disciplined in the face of temptation Sets one or more tasks/goals and shows motivation or passion to complete them; is determined Demonstrates good organizational skills (e.g., plans ahead, manages time wisely, arrives to class prepared, etc.)

Table B.6. Item List for the 6 Dimensions Derived, Taxonomy Project. (cont.)

	Civic Values	Identifies and takes advantage of available resources in order to accomplish a goal, sometimes in the context of limited resources Shows a willingness to learn from one's mistakes Is aware of and works to correct unfairness/promote social justice in school, community, and the world Understands one's connection and responsibility to family, classroom, school community, neighborhood, country, and world; understands the value of civic responsibility Understands and actively participates in democratic process (e.g., votes, stays informed, involved in community affairs, etc.) Strives to help others to make their community and/or world a better place (e.g., through community service)

Table B.6. Item List for the 6 Dimensions Derived, Taxonomy Project. (cont.)

		Expresses love of and loyalty to the things that are good about one's country (e.g., patriotic)
		Values and works toward consensus (e.g., strives to find common ground as opposed to debating or convincing)
		Is willing to make personal sacrifices for friends, family, and country
		Volunteers to help when needed
		Understands the importance of setting a good example for others and acting as a positive influence
		Understands the need for rules/ laws and makes reasoned decisions about when and how to advocate for their change
	Intellectual Values	Displays a love of learning (e.g., is enthusiastic about and actively engaged in learning)
		Expresses an eagerness to know and learn new things (e.g., is curious)

Table B.6. Item List for the 6 Dimensions Derived, Taxonomy Project. (cont.)

		Seeks out new information and learns new skills on one's own Demonstrates a willingness to admit error and change one's mind when confronted with new evidence Investigates the truth (e.g., does not simply accept information and evidence at face value) Thinks outside the box; approaches tasks and problems in novel ways (e.g., is creative) Thinks things through from all sides; avoids jumping to conclusions (e.g. about people, circumstances, situations, etc.)
Perspectives	**Optimism**	Expresses optimism and/or maintains optimistic outlook Expects good things to happen Approaches and reflects on challenging situations with a positive attitude
	Gratitude	Expresses gratitude and appreciation for good and/or everyday things
	Opennes	Adapts willingly and easily to change, both positive and negative

Table B.6. Item List for the 6 Dimensions Derived, Taxonomy Project. (cont.)

		Notices and appreciates beauty and excellence Accepts both past and present circumstances or feelings in life (e.g., is able to consider them without opinion or judgement) Receptive to new and unfamiliar ideas, feelings, and experiences Interested in and open to whatever is in the present moment
	Enthusiasm/Zest	Approaches activities with enthusiasm and excitement
Identity	**Self-Knowledge**	Identifies and understands personality/ character traits Recognizes and understands one's own strengths and weaknesses Honest about what you know and don't know Develop and maintain a coherent sense of self and roles over time Identifies and understands one's interests and preferences
	Purpose	Considers existential questions (e.g., what is the purpose of my life, what is my life passion, what is happiness,

Table B.6. Item List for the 6 Dimensions Derived, Taxonomy Project. (cont.)

		what is my place in the world, etc.) Imagines the future; formulates life goals and ways to pursue them Expresses and derives comfort from a belief in something greater than self
	Self-Efficacy/ Growth Mindset	Believes that intellectual abilities and personality traits are qualities that can be developed and improved Expresses confidence in oneself and one's ability to improve or succeed Sees challenges as things that one can take on and overcome with time and effort Belief that one has a choice (agency)
	Self-Esteem	Feels a sense of belonging; feels valued by others in the community Extends kindness and understanding to oneself (e.g., has self-compassion, emotional self- respect, etc.) Forgives oneself for errors and

Table B.6. Item List for the 6 Dimensions Derived, Taxonomy Project. (cont.)

		mistakes (e.g., accepts and moves on from past actions) Demonstrates physical self-respect by maintaining good hygiene Understands the effects of risk behaviors (e.g., drugs, alcohol, tobacco, sex, etc.) on their body and uses that information to make responsible choices Believes that one is not defined by one's thoughts, emotions, or circumstances

APPENDIX B: YEN'S Q3 STATISTICS' RESULTS FOR THE LOCAL INDEPENDENCE ASSUMPTION

Table B.1. Yen's Q3 statistics' results for the local independence assumption.

	M1	**M2**	**M3**	**M4**	**M5**	**M6**	**M7**	**M8**	**M9**	**M10**
M1	1.000	0.177	0.117	0.093	0.229	0.088	0.026	-0.028	0.021	0.125
M2	0.177	1.000	0.100	0.086	-0.010	0.086	0.064	0.018	-0.005	0.094
M3	0.117	0.100	1.000	0.040	0.109	-0.048	0.201	0.095	0.18 0	-0.076
M4	0.093	0.086	0.040	1.000	0.067	0.143	0.021	-0.012	0.062	0.060
M5	0.229	-0.010	0.109	0.067	1.000	0.044	-0.005	-0.070	0.08 1	0.034
M6	0.088	0.086	-0.048	0.143	0.044	1.000	0.038	0.028	-0.065	0.159
M7	0.026	0.064	0.201	0.021	-0.005	0.038	1.000	0.215	0.098	0.075
M8	0.028	0.018	0.095	-0.012	-0.070	0.028	0.215	1.000	0.067	0.024
M9	0.021	-0.005	0.180	0.062	0.08 1	-0.065	0.098	0.067	1.000	-0.026
M10	0.125	0.094	-0.076	0.060	0.034	0.159	0.075	0.024	-0.026	1.000
M11	0.064	0.024	0.131	-0.035	-0.029	-0.035	0.185	0.112	0.127	0.086
M12	-0.004	-0.031	0.130	0.077	-0.008	-0.021	0.106	-0.024	0.057	0.025
M 3	0.012	-0.026	0.050	0.140	0.101	0.171	0.048	0.08 1	0.103	0.098
M14	-0.028	0.043	0.015	0.023	-0.005	0.033	0.103	0.191	0.076	0.045
M15	0.08 0	-0.101	0.031	0.131	0.091	0.194	0.062	-0.034	0.062	0.193
M16	0.175	0.018	-0.032	-0.010	0.063	-0.041	0.026	-0.096	-0.032	0.094
M17	0.005	-0.032	0.054	0.046	-0.049	0.098	0.009	0.075	0.094	0.013

Table B.6. Yen's Q3 statistics' results for the local independence assumption. (cont.)

	M1	**M2**	**M3**	**M4**	**M5**	**M6**	**M7**	**M8**	**M9**	**M10**
M18	0.008	0.001	0.046	0.016	-0.001	0.047	0.007	0.070	0.126	0.073
M19	0.093	0.007	0.053	0.025	0.002	-0.011	0.069	-0.002	0.134	0.040
M20	0.018	0.003	0.157	0.076	0.012	-0.034	0.120	0.08 1	0.195	-0.014
M21	-0.024	-0.013	0.047	0.077	0.026	0.044	0.064	0.035	0.112	0.077
M22	-0.019	0.007	0.041	0.055	0.034	0.092	-0.016	0.018	0.006	0.010
M23	-0.090	0.025	0.049	0.026	-0.027	-0.029	0.042	0.017	0.044	-0.046
M24	-0.050	-0.022	-0.028	-0.020	-0.033	-0.084	-0.001	0.039	-0.099	-0.007
M25	0.027	-0.039	-0.078	0.066	-0.003	0.008	-0.073	-0.08 0	-0.062	0.034
M26	-0.120	-0.08 0	-0.007	-0.05 1	-0.116	-0.092	-0.002	-0.025	0.008	-0.069
M27	-0.048	-0.054	0.052	-0.055	-0.021	-0.146	-0.019	-0.002	0.123	-0.110
M28	-0.077	-0.105	0.031	0.019	0.05 0	0.006	-0.004	-0.049	0.08 1	-0.05 0
M29	-0.034	-0.040	-0.002	-0.061	0.08 1	-0.077	-0.096	-0.005	0.005	-0.021
M30	-0.097	-0.039	-0.108	-0.033	-0.020	-0.029	-0.106	-0.086	-0.108	-0.036
M31	0.017	-0.049	-0.010	0.066	0.021	0.083	-0.014	-0.106	-0.019	-0.007
M32	0.041	-0.046	-0.053	0.037	0.064	0.061	-0.093	-0.016	-0.059	-0.032
M33	-0.020	-0.005	0.014	-0.049	0.006	-0.043	-0.057	0.029	0.014	-0.111
M34	-0.053	-0.063	-0.089	0.024	0.078	0.058	-0.108	-0.115	-0.076	-0.070
M35	-0.017	0.039	-0.008	-0.072	-0.035	-0.088	-0.003	0.049	0.05 1	-0.093
M36	-0.064	-0.048	-0.008	-0.007	0.012	-0.047	-0.078	-0.072	-0.015	-0.05 1

Table B.6. Yen's Q3 statistics' results for the local independence assumption. (cont.)

	M1	**M2**	**M3**	**M4**	**M5**	**M6**	**M7**	**M8**	**M9**	**M10**
M37	-0.092	-0.043	-0.062	-0.013	-0.079	-0.015	-0.016	-0.107	-0.077	0.007
M38	0.007	0.002	-0.022	-0.073	-0.013	0.020	0.077	0.019	-0.074	0.011
M39	-0.042	-0.069	-0.040	-0.028	-0.031	0.120	-0.003	-0.059	-0.035	0.064
M40	-0.042	-0.056	-0.171	-0.037	0.004	0.08 1	-0.121	-0.144	-0.114	-0.022
M	-0.078	-0.044	-0.034	-0.052	-0.009	-0.106	-0.072	-0.004	-0.070	-0.069
M42	-0.066	-0.006	-0.093	0.054	-0.077	-0.015	-0.070	-0.043	0.066	-0.074
M43	-0.070	-0.061	0.004	-0.127	-0.033	-0.086	-0.053	-0.008	-0.047	-0.135
M44	-0.083	0.025	0.028	-0.019	-0.057	-0.036	-0.061	-0.065	-0.140	-0.073
M45	-0.062	0.010	-0.074	-0.015	-0.017	-0.024	-0.124	-0.102	-0.110	-0.118
M46	-0.054	0.031	0.007	-0.012	-0.106	-0.048	-0.005	-0.040	-0.016	0.032
M47	-0.005	0.056	-0.116	-0.012	-0.022	0.025	-0.077	-0.153	-0.184	-0.020
M48	-0.014	0.014	-0.089	-0.057	-0.029	0.028	0.003	-0.073	-0.059	0.007
M49	0.003	-0.055	-0.007	-0.128	-0.019	-0.035	-0.055	0.035	-0.05 1	-0.065
M50	0.096	0.082	-0.087	-0.002	0.025	0.149	-0.120	-0.129	-0.135	0.104
M51	0.070	0.069	-0.061	0.026	0.043	0.198	-0.109	-0.103	-0.129	0.011
M52	0.047	-0.021	-0.112	0.056	0.052	0.152	-0.08 1	-0.084	-0.145	0.015
M53	0.045	-0.021	0.004	-0.045	-0.040	-0.047	0.005	0.024	0.062	0.038
M54	-0.070	-0.034	-0.075	0.017	-0.056	-0.040	-0.042	-0.036	-0.135	-0.078
M56	0.020	-0.060	-0.124	0.053	-0.024	0.106	-0.146	-0.112	-0.095	-0.028
M57	0.019	0.017	-0.031	-0.065	0.023	-0.027	-0.109	-0.028	-0.040	-0.038

Table B.2. Yen's Q3 statistics' results for the local independence assumption.

	M11	**M12**	**M13**	**M14**	**M15**	**M16**	**M17**	**M18**	**M19**	**M20**
M1	0.064	-0.004	0.012	-0.028	0.080	0.175	0.005	0.008	0.093	0.018
M2	0.024	-0.031	-0.026	0.043	-0.101	0.018	-0.032	0.001	0.007	0.003
M3	0.131	0.13 0	0.05 0	0.015	0.031	-0.032	0.054	0.046	0.053	0.157
M4	-0.035	0.077	0.140	0.023	0.131	-0.010	0.046	0.016	0.025	0.076
M5	-0.029	-0.008	0.101	-0.005	0.091	0.063	-0.049	-0.001	0.002	0.012
M6	-0.035	-0.021	0.171	0.033	0.194	-0.041	0.098	0.047	-0.011	-0.034
M7	0.185	0.106	0.048	0.103	0.062	0.026	0.009	0.007	0.069	0.120
M8	0.112	-0.024	0.08 1	0.191	-0.034	-0.096	0.075	0.070	-0.002	0.08 1
M9	0.127	0.057	0.103	0.076	0.062	-0.032	0.094	0.126	0.134	0.195
M10	0.086	0.025	0.098	0.045	0.193	0.094	0.013	0.073	0.040	-0.014
M11	1.000	0.219	0.031	0.065	0.104	-0.043	0.069	0.057	0.034	0.068
M12	0.219	1.000	0.041	0.022	0.107	-0.001	-0.015	0.016	0.043	0.041
M 3	0.031	0.041	1.000	0.012	0.177	-0.037	0.063	0.013	0.054	0.034
M14	0.065	0.022	0.012	1.000	0.021	0.03 0	0.049	0.001	0.124	0.046
M15	0.104	0.107	0.177	0.021	1.000	0.024	-0.018	-0.03 0	0.098	0.05 0
M16	-0.043	-0.001	-0.037	0.03 0	0.024	1.000	-0.049	0.033	0.034	-0.079
M17	0.069	-0.015	0.063	0.049	-0.018	-0.049	1.000	0.056	0.157	0.229

Table B.6. Yen's Q3 statistics' results for the local independence assumption. (cont.)

	M11	**M12**	**M13**	**M14**	**M15**	**M16**	**M17**	**M18**	**M19**	**M20**
M18	0.057	0.016	0.013	0.001	-0.03 0	0.033	0.056	1.000	0.084	0.087
M19	0.034	0.043	0.054	0.124	0.098	0.034	0.157	0.084	1.000	0.182
M20	0.068	0.041	0.034	0.046	0.05 0	-0.079	0.229	0.087	0.182	1.000
M21	0.034	-0.049	0.095	0.067	0.029	-0.142	0.293	0.045	0.166	0.336
M22	0.019	0.020	0.000	-0.046	0.000	-0.048	0.110	-0.076	-0.005	0.08 1
M23	0.074	0.090	0.023	0.070	-0.023	-0.002	0.032	0.090	-0.031	0.019
M24	0.016	0.005	-0.085	-0.115	-0.015	-0.010	-0.073	0.002	-0.118	-0.097
M25	-0.035	0.05 1	-0.046	-0.089	0.076	0.006	-0.154	-0.042	-0.034	-0.055
M26	-0.005	0.006	-0.006	0.003	-0.08 0	-0.104	0.048	-0.063	0.021	-0.023
M27	0.071	0.011	-0.099	-0.063	-0.116	-0.070	0.018	0.035	-0.002	0.069
M28	-0.078	0.040	0.071	-0.044	-0.026	-0.091	-0.001	-0.026	0.061	0.015
M29	-0.046	-0.089	0.043	-0.095	-0.017	0.067	-0.059	0.004	-0.05 0	-0.092
M30	-0.014	-0.011	-0.014	-0.056	-0.001	0.016	-0.082	0.007	-0.053	-0.057
M31	-0.003	0.08 0	0.010	-0.011	0.084	0.103	-0.072	0.023	-0.066	-0.08 1
M32	-0.164	-0.120	0.026	-0.046	0.021	0.015	0.038	-0.019	-0.005	-0.036
M33	-0.076	-0.05 0	-0.025	-0.008	-0.083	-0.020	-0.008	-0.046	-0.035	-0.026
M34	-0.139	-0.067	0.037	-0.056	-0.05 0	0.001	-0.070	-0.078	-0.084	-0.049
M35	-0.036	-0.068	-0.003	-0.007	-0.095	-0.153	0.001	-0.015	-0.062	-0.041
M36	-0.054	-0.031	-0.03 0	-0.071	-0.048	-0.069	-0.020	0.05 0	-0.023	0.072

Table B.6. Yen's Q3 statistics' results for the local independence assumption. (cont.)

	M11	**M12**	**M13**	**M14**	**M15**	**M16**	**M17**	**M18**	**M19**	**M20**
M37	-0.002	-0.044	0.012	0.03 0	0.084	0.05 0	-0.123	0.023	-0.033	-0.046
M38	0.056	0.039	-0.028	0.046	-0.035	0.132	-0.145	-0.005	-0.054	-0.088
M39	-0.069	-0.044	0.019	-0.026	-0.004	0.039	-0.046	0.026	-0.037	-0.016
M40	-0.121	-0.106	-0.052	-0.107	0.004	0.042	-0.044	-0.128	-0.124	-0.148
M	-0.041	0.024	-0.098	-0.023	0.006	-0.062	-0.120	-0.107	-0.094	-0.089
M42	-0.008	0.004	0.007	-0.041	-0.024	-0.060	0.078	0.027	-0.023	-0.059
M43	-0.040	-0.018	-0.067	0.044	-0.100	0.033	-0.121	-0.003	-0.101	-0.115
M44	-0.052	-0.066	-0.054	-0.016	-0.072	-0.016	-0.128	-0.056	-0.154	-0.209
M45	-0.107	-0.08 0	-0.082	-0.084	-0.03 0	0.008	-0.086	-0.034	-0.112	-0.157
M46	0.010	0.033	-0.042	0.034	0.029	-0.060	-0.143	0.03 0	-0.070	-0.061
M47	-0.061	-0.121	-0.092	-0.149	-0.05 1	0.061	-0.175	-0.143	-0.171	-0.237
M48	-0.060	-0.036	-0.036	0.05 1	-0.010	0.017	-0.126	-0.014	-0.061	-0.090
M49	0.016	-0.040	0.013	0.006	-0.011	0.011	-0.046	-0.047	-0.093	-0.068
M50	-0.145	-0.034	-0.071	-0.052	0.015	0.117	-0.048	0.070	-0.056	-0.110
M51	-0.101	-0.090	-0.003	-0.053	-0.044	0.025	-0.010	0.006	-0.014	-0.131
M52	-0.090	-0.061	0.017	-0.03 0	0.055	0.085	-0.070	-0.017	-0.035	-0.132
M53	0.052	-0.054	0.022	0.000	-0.028	-0.026	0.015	-0.001	0.003	-0.073
M54	-0.032	-0.094	-0.015	-0.057	-0.056	0.035	-0.138	-0.039	-0.067	-0.183
M56	-0.172	-0.136	0.058	-0.097	-0.010	0.024	-0.046	-0.022	-0.039	-0.066
M57	-0.074	-0.113	-0.016	-0.019	-0.18 0	0.010	-0.089	-0.057	-0.027	-0.025

Table B.3. Yen's Q3 statistics' results for the local independence assumption.

	M21	**M22**	**M23**	**M24**	**M25**	**M26**	**M27**	**M28**	**M29**	**M30**
M1	-0.024	-0.019	-0.090	-0.050	0.027	-0.120	-0.048	-0.077	-0.034	-0.097
M2	-0.013	0.007	0.025	-0.022	-0.039	-0.08 0	-0.054	-0.105	-0.040	-0.039
M3	0.047	0.041	0.049	-0.028	-0.078	-0.007	0.052	0.031	-0.002	-0.108
M4	0.077	0.055	0.026	-0.020	0.066	-0.05 1	-0.055	0.019	-0.061	-0.033
M5	0.026	0.034	-0.027	-0.033	-0.003	-0.116	-0.021	0.05 0	0.08 1	-0.020
M6	0.044	0.092	-0.029	-0.084	0.008	-0.092	-0.146	0.006	-0.077	-0.029
M7	0.064	-0.016	0.042	-0.001	-0.073	-0.002	-0.019	-0.004	-0.096	-0.106
M8	0.035	0.018	0.017	0.039	-0.08 0	-0.025	-0.002	-0.049	-0.005	-0.086
M9	0.112	0.006	0.044	-0.099	-0.062	0.008	0.123	0.08 1	0.005	-0.108
M10	0.077	0.010	-0.046	-0.007	0.034	-0.069	-0.110	-0.05 0	-0.021	-0.036
M11	0.034	0.019	0.074	0.016	-0.035	-0.005	0.071	-0.078	-0.046	-0.014
M12	-0.049	0.020	0.090	0.005	0.05 1	0.006	0.011	0.040	-0.089	-0.011
M 3	0.095	0.000	0.023	-0.085	-0.046	-0.006	-0.099	0.071	0.043	-0.014
M14	0.067	-0.046	0.070	-0.115	-0.089	0.003	-0.063	-0.044	-0.095	-0.056
M15	0.029	0.000	-0.023	-0.015	0.076	-0.08 0	-0.116	-0.026	-0.017	-0.001
M16	-0.142	-0.048	-0.002	-0.010	0.006	-0.104	-0.070	-0.091	0.067	0.016
M17	0.293	0.110	0.032	-0.073	-0.154	0.048	0.018	-0.001	-0.059	-0.082

Table B.6. Yen's Q3 statistics' results for the local independence assumption. (cont.)

	M21	**M22**	**M23**	**M24**	**M25**	**M26**	**M27**	**M28**	**M29**	**M30**
M18	0.045	-0.076	0.090	0.002	-0.042	-0.063	0.035	-0.026	0.004	0.007
M19	0.166	-0.005	-0.031	-0.118	-0.034	0.021	-0.002	0.061	-0.05 0	-0.053
M20	0.336	0.08 1	0.019	-0.097	-0.055	-0.023	0.069	0.015	-0.092	-0.057
M21	1.000	0.190	0.089	-0.073	-0.090	0.077	0.032	0.113	-0.138	-0.158
M22	0.190	1.000	0.044	0.007	-0.018	-0.014	0.064	0.007	0.027	-0.035
M23	0.089	0.044	1.000	0.075	-0.054	0.000	0.002	0.007	0.001	-0.055
M24	-0.073	0.007	0.075	1.000	0.058	0.087	0.031	-0.05 1	0.084	-0.004
M25	-0.090	-0.018	-0.054	0.058	1.000	0.056	-0.042	-0.08 0	-0.009	0.113
M26	0.077	-0.014	0.000	0.087	0.056	1.000	0.093	0.078	-0.047	0.035
M27	0.032	0.064	0.002	0.031	-0.042	0.093	1.000	0.087	0.007	-0.004
M28	0.113	0.007	0.007	-0.05 1	-0.08 0	0.078	0.087	1.000	0.023	-0.017
M29	-0.138	0.027	0.001	0.084	-0.009	-0.047	0.007	0.023	1.000	0.169
M30	-0.158	-0.035	-0.055	-0.004	0.113	0.035	-0.004	-0.017	0.169	1.000
M31	-0.074	-0.004	-0.015	0.004	0.093	-0.054	-0.104	0.012	0.018	0.085
M32	0.067	-0.041	-0.064	-0.113	-0.065	-0.03 0	0.040	0.004	-0.105	-0.094
M33	-0.05 1	0.021	0.020	-0.133	-0.047	-0.026	0.047	-0.05 0	0.013	-0.070
M34	-0.03 0	-0.025	0.001	-0.011	-0.023	-0.033	-0.003	0.064	-0.041	-0.008
M35	0.064	-0.011	0.023	-0.033	-0.156	-0.001	0.002	-0.011	-0.064	-0.087
M36	0.032	-0.043	-0.003	-0.08 0	-0.002	-0.057	-0.015	0.004	-0.073	-0.012

Table B.6. Yen's Q3 statistics' results for the local independence assumption. (cont.)

	M21	**M22**	**M23**	**M24**	**M25**	**M26**	**M27**	**M28**	**M29**	**M30**
M37	-0.122	-0.071	-0.069	-0.03 0	0.088	-0.054	-0.021	-0.016	-0.034	0.032
M38	-0.156	-0.103	-0.073	-0.08 1	0.099	-0.013	-0.055	-0.122	-0.064	0.118
M39	-0.101	-0.123	-0.047	-0.069	-0.042	-0.039	-0.038	-0.001	0.014	0.073
M40	-0.168	-0.003	-0.021	0.005	0.099	0.003	-0.028	-0.043	-0.017	0.013
M	-0.154	-0.092	-0.028	-0.009	0.078	-0.045	-0.008	-0.095	0.057	0.089
M42	0.012	0.000	-0.035	0.038	-0.011	0.060	0.000	-0.021	-0.085	-0.069
M43	-0.088	-0.019	-0.056	-0.03 0	-0.064	-0.058	-0.028	-0.098	0.001	0.058
M44	-0.168	-0.015	-0.031	0.094	0.009	0.035	-0.110	-0.061	-0.010	0.054
M45	-0.08 0	-0.05 0	-0.135	0.028	0.073	-0.028	-0.079	-0.033	-0.010	0.107
M46	-0.090	-0.104	-0.044	0.016	0.015	-0.090	0.025	-0.058	0.006	0.001
M47	-0.212	-0.076	-0.037	0.035	0.059	-0.157	-0.078	-0.054	0.024	0.069
M48	-0.118	-0.165	0.054	-0.062	0.010	-0.089	-0.121	-0.029	-0.017	-0.032
M49	-0.060	-0.019	-0.054	-0.079	-0.048	-0.126	-0.061	-0.053	-0.006	-0.019
M50	-0.091	-0.078	-0.067	-0.061	-0.015	-0.061	-0.177	-0.062	-0.056	-0.022
M51	-0.070	-0.056	-0.05 1	-0.142	-0.012	-0.065	-0.065	-0.03 0	-0.010	-0.090
M52	-0.092	-0.009	-0.060	-0.047	-0.015	-0.090	-0.155	-0.099	0.014	-0.041
M53	0.006	-0.008	-0.039	-0.05 0	-0.171	-0.076	-0.041	0.046	-0.018	-0.066
M54	-0.179	-0.085	-0.146	0.143	0.026	-0.062	-0.126	-0.008	0.020	0.014
M56	-0.110	-0.029	-0.110	-0.015	0.094	-0.027	-0.088	0.027	0.063	0.072
M57	-0.047	-0.027	0.047	-0.077	-0.059	-0.043	-0.029	-0.094	-0.096	-0.087

Table B.4. Yen's Q3 statistics' results for the local independence assumption.

	M31	**M32**	**M33**	**M34**	**M35**	**M36**	**M37**	**M38**	**M39**	**M40**
M1	0.017	0.041	-0.020	-0.053	-0.017	-0.064	-0.092	0.007	-0.042	-0.042
M2	-0.049	-0.046	-0.005	-0.063	0.039	-0.048	-0.043	0.002	-0.069	-0.056
M3	-0.010	-0.053	0.014	-0.089	-0.008	-0.008	-0.062	-0.022	-0.040	-0.171
M4	0.066	0.037	-0.049	0.024	-0.072	-0.007	-0.013	-0.073	-0.028	-0.037
M5	0.021	0.064	0.006	0.078	-0.035	0.012	-0.079	-0.013	-0.031	0.004
M6	0.083	0.061	-0.043	0.058	-0.088	-0.047	-0.015	0.020	0.120	0.08 1
M7	-0.014	-0.093	-0.057	-0.108	-0.003	-0.078	-0.016	0.077	-0.003	-0.121
M8	-0.106	-0.016	0.029	-0.115	0.049	-0.072	-0.107	0.019	-0.059	-0.144
M9	-0.019	-0.059	0.014	-0.076	0.05 1	-0.015	-0.077	-0.074	-0.035	-0.114
M10	-0.007	-0.032	-0.111	-0.070	-0.093	-0.05 1	0.007	0.011	0.064	-0.022
M11	-0.003	-0.164	-0.076	-0.139	-0.036	-0.054	-0.002	0.056	-0.069	-0.121
M12	0.08 0	-0.120	-0.05 0	-0.067	-0.068	-0.031	-0.044	0.039	-0.044	-0.106
M 3	0.010	0.026	-0.025	0.037	-0.003	-0.03 0	0.012	-0.028	0.019	-0.052
M14	-0.011	-0.046	-0.008	-0.056	-0.007	-0.071	0.03 0	0.046	-0.026	-0.107
M15	0.084	0.021	-0.083	-0.05 0	-0.095	-0.048	0.084	-0.035	-0.004	0.004
M16	0.103	0.015	-0.020	0.001	-0.153	-0.069	0.05 0	0.132	0.039	0.042
M17	-0.072	0.038	-0.008	-0.070	0.001	-0.020	-0.123	-0.145	-0.046	-0.044

Table B.6. Yen's Q3 statistics' results for the local independence assumption. (cont.)

	M31	**M32**	**M33**	**M34**	**M35**	**M36**	**M37**	**M38**	**M39**	**M40**
M18	0.023	-0.019	-0.046	-0.078	-0.015	0.05 0	0.023	-0.005	0.026	-0.128
M19	-0.066	-0.005	-0.035	-0.084	-0.062	-0.023	-0.033	-0.054	-0.037	-0.124
M20	-0.08 1	-0.036	-0.026	-0.049	-0.041	0.072	-0.046	-0.088	-0.016	-0.148
M21	-0.074	0.067	-0.05 1	-0.03 0	0.064	0.032	-0.122	-0.156	-0.101	-0.168
M22	-0.004	-0.041	0.021	-0.025	-0.011	-0.043	-0.071	-0.103	-0.123	-0.003
M23	-0.015	-0.064	0.020	0.001	0.023	-0.003	-0.069	-0.073	-0.047	-0.021
M24	0.004	-0.113	-0.133	-0.011	-0.033	-0.08 0	-0.03 0	-0.08 1	-0.069	0.005
M25	0.093	-0.065	-0.047	-0.023	-0.156	-0.002	0.088	0.099	-0.042	0.099
M26	-0.054	-0.03 0	-0.026	-0.033	-0.001	-0.057	-0.054	-0.013	-0.039	0.003
M27	-0.104	0.040	0.047	-0.003	0.002	-0.015	-0.021	-0.055	-0.038	-0.028
M28	0.012	0.004	-0.05 0	0.064	-0.011	0.004	-0.016	-0.122	-0.001	-0.043
M29	0.018	-0.105	0.013	-0.041	-0.064	-0.073	-0.034	-0.064	0.014	-0.017
M30	0.085	-0.094	-0.070	-0.008	-0.087	-0.012	0.032	0.118	0.073	0.013
M31	1.000	0.005	-0.092	0.026	-0.159	-0.060	0.083	0.120	-0.011	0.016
M32	0.005	1.000	0.203	0.091	0.031	-0.003	-0.055	-0.096	0.049	-0.038
M33	-0.092	0.203	1.000	0.126	0.052	0.038	-0.05 1	-0.117	0.034	-0.094
M34	0.026	0.091	0.126	1.000	-0.007	0.016	0.141	-0.014	0.064	0.052
M35	-0.159	0.031	0.052	-0.007	1.000	0.164	-0.094	-0.085	-0.076	-0.083
M36	-0.060	-0.003	0.038	0.016	0.164	1.000	0.079	-0.014	-0.042	-0.105

Table B.6. Yen's Q3 statistics' results for the local independence assumption. (cont.)

	M31	**M32**	**M33**	**M34**	**M35**	**M36**	**M37**	**M38**	**M39**	**M40**
M37	0.083	-0.055	-0.05 1	0.141	-0.094	0.079	1.000	0.284	0.107	0.024
M38	0.120	-0.096	-0.117	-0.014	-0.085	-0.014	0.284	1.000	0.08 1	0.027
M39	-0.011	0.049	0.034	0.064	-0.076	-0.042	0.107	0.08 1	1.000	0.126
M40	0.016	-0.038	-0.094	0.052	-0.083	-0.105	0.024	0.027	0.126	1.000
M	0.011	-0.033	0.006	-0.048	-0.033	-0.054	0.026	0.083	0.037	0.037
M42	-0.021	-0.059	-0.045	-0.017	-0.086	-0.059	-0.074	-0.053	0.001	0.053
M43	0.002	-0.068	0.063	0.000	0.000	0.007	-0.08 0	-0.012	-0.071	-0.111
M44	-0.033	-0.08 0	-0.104	-0.016	-0.049	-0.028	-0.013	0.034	-0.023	0.106
M45	0.078	-0.063	-0.060	-0.039	-0.010	-0.052	0.000	0.040	-0.068	0.083
M46	-0.039	-0.079	0.008	-0.038	0.011	0.015	0.076	0.039	0.014	-0.111
M47	-0.002	-0.022	0.016	0.021	0.007	-0.065	-0.006	0.028	0.103	0.136
M48	0.027	-0.075	-0.039	0.027	-0.077	-0.073	0.046	0.099	0.075	0.063
M49	-0.022	0.047	0.101	-0.072	0.046	-0.067	-0.066	-0.025	0.023	0.006
M50	0.072	0.041	-0.013	0.048	-0.035	0.027	0.046	-0.014	0.105	0.037
M51	0.009	0.075	0.007	0.049	-0.067	-0.056	-0.031	-0.091	0.122	0.113
M52	0.040	-0.008	-0.034	0.070	-0.062	-0.028	0.055	0.066	0.182	0.094
M53	-0.035	-0.002	0.069	-0.076	0.098	-0.058	-0.060	-0.082	-0.012	-0.069
M54	-0.027	-0.08 1	-0.047	-0.053	-0.034	-0.021	0.041	0.020	0.005	0.048
M56	-0.003	-0.022	-0.085	0.071	-0.074	0.007	0.086	0.022	0.049	0.28 1
M57	-0.061	0.036	0.074	0.059	0.200	0.128	-0.074	-0.053	-0.014	-0.014

Table B.5. Yen's Q3 statistics' results for the local independence assumption.

	M41	**M42**	**M43**	**M44**	**M45**	**M46**	**M47**	**M48**	**M49**	**M50**
M1	-0.078	-0.066	-0.070	-0.083	-0.062	-0.054	-0.005	-0.014	0.003	0.096
M2	-0.044	-0.006	-0.061	0.025	0.010	0.031	0.056	0.014	-0.055	0.082
M3	-0.034	-0.093	0.004	0.028	-0.074	0.007	-0.116	-0.089	-0.007	-0.087
M4	-0.052	0.054	-0.127	-0.019	-0.015	-0.012	-0.012	-0.057	-0.128	-0.002
M5	-0.009	-0.077	-0.033	-0.057	-0.017	-0.106	-0.022	-0.029	-0.019	0.025
M6	-0.106	-0.015	-0.086	-0.036	-0.024	-0.048	0.025	0.028	-0.035	0.149
M7	-0.072	-0.070	-0.053	-0.061	-0.124	-0.005	-0.077	0.003	-0.055	-0.120
M8	-0.004	-0.043	-0.008	-0.065	-0.102	-0.040	-0.153	-0.073	0.035	-0.129
M9	-0.070	0.066	-0.047	-0.140	-0.110	-0.016	-0.184	-0.059	-0.05 1	-0.135
M10	-0.069	-0.074	-0.135	-0.073	-0.118	0.032	-0.020	0.007	-0.065	0.104
M11	-0.041	-0.008	-0.040	-0.052	-0.107	0.010	-0.061	-0.060	0.016	-0.145
M12	0.024	0.004	-0.018	-0.066	-0.08 0	0.033	-0.121	-0.036	-0.040	-0.034
M 3	-0.098	0.007	-0.067	-0.054	-0.082	-0.042	-0.092	-0.036	0.013	-0.071
M14	-0.023	-0.041	0.044	-0.016	-0.084	0.034	-0.149	0.05 1	0.006	-0.052
M15	0.006	-0.024	-0.100	-0.072	-0.03 0	0.029	-0.05 1	-0.010	-0.011	0.015
M16	-0.062	-0.060	0.033	-0.016	0.008	-0.060	0.061	0.017	0.011	0.117
M17	-0.120	0.078	-0.121	-0.128	-0.086	-0.143	-0.175	-0.126	-0.046	-0.048

Table B.6. Yen's Q3 statistics' results for the local independence assumption. (cont.)

	M41	**M42**	**M43**	**M44**	**M45**	**M46**	**M47**	**M48**	**M49**	**M50**
M18	-0.107	0.027	-0.003	-0.056	-0.034	0.03 0	-0.143	-0.014	-0.047	0.070
M19	-0.094	-0.023	-0.101	-0.154	-0.112	-0.070	-0.171	-0.061	-0.093	-0.056
M20	-0.089	-0.059	-0.115	-0.209	-0.157	-0.061	-0.237	-0.090	-0.068	-0.110
M21	-0.154	0.012	-0.088	-0.168	-0.08 0	-0.090	-0.212	-0.118	-0.060	-0.091
M22	-0.092	0.000	-0.019	-0.015	-0.05 0	-0.104	-0.076	-0.165	-0.019	-0.078
M23	-0.028	-0.035	-0.056	-0.031	-0.135	-0.044	-0.037	0.054	-0.054	-0.067
M24	-0.009	0.038	-0.03 0	0.094	0.028	0.016	0.035	-0.062	-0.079	-0.061
M25	0.078	-0.011	-0.064	0.009	0.073	0.015	0.059	0.010	-0.048	-0.015
M26	-0.045	0.060	-0.058	0.035	-0.028	-0.090	-0.157	-0.089	-0.126	-0.061
M27	-0.008	0.000	-0.028	-0.110	-0.079	0.025	-0.078	-0.121	-0.061	-0.177
M28	-0.095	-0.021	-0.098	-0.061	-0.033	-0.058	-0.054	-0.029	-0.053	-0.062
M29	0.057	-0.085	0.001	-0.010	-0.010	0.006	0.024	-0.017	-0.006	-0.056
M30	0.089	-0.069	0.058	0.054	0.107	0.001	0.069	-0.032	-0.019	-0.022
M31	0.011	-0.021	0.002	-0.033	0.078	-0.039	-0.002	0.027	-0.022	0.072
M32	-0.033	-0.059	-0.068	-0.08 0	-0.063	-0.079	-0.022	-0.075	0.047	0.041
M33	0.006	-0.045	0.063	-0.104	-0.060	0.008	0.016	-0.039	0.101	-0.013
M34	-0.048	-0.017	0.000	-0.016	-0.039	-0.038	0.021	0.027	-0.072	0.048
M35	-0.033	-0.086	0.000	-0.049	-0.010	0.011	0.007	-0.077	0.046	-0.035
M36	-0.054	-0.059	0.007	-0.028	-0.052	0.015	-0.065	-0.073	-0.067	0.027

Table B.6. Yen's Q3 statistics' results for the local independence assumption. (cont.)

	M41	**M42**	**M43**	**M44**	**M45**	**M46**	**M47**	**M48**	**M49**	**M50**
M37	0.026	-0.074	-0.08 0	-0.013	0.000	0.076	-0.006	0.046	-0.066	0.046
M38	0.083	-0.053	-0.012	0.034	0.040	0.039	0.028	0.099	-0.025	-0.014
M39	0.037	0.001	-0.071	-0.023	-0.068	0.014	0.103	0.075	0.023	0.105
M40	0.037	0.053	-0.111	0.106	0.083	-0.111	0.136	0.063	0.006	0.037
M	1.000	-0.037	0.091	-0.006	0.056	0.025	0.040	0.024	0.005	-0.044
M42	-0.037	1.000	-0.063	-0.088	-0.027	-0.041	-0.101	0.002	-0.010	0.013
M43	0.091	-0.063	1.000	0.141	0.112	0.001	0.017	-0.018	0.110	-0.017
M44	-0.006	-0.088	0.141	1.000	0.315	0.058	0.093	-0.068	0.020	-0.022
M45	0.056	-0.027	0.112	0.315	1.000	0.040	0.099	0.006	-0.038	0.057
M46	0.025	-0.041	0.001	0.058	0.040	1.000	-0.010	0.092	0.020	0.048
M47	0.040	-0.101	0.017	0.093	0.099	-0.010	1.000	0.232	0.054	0.067
M48	0.024	0.002	-0.018	-0.068	0.006	0.092	0.232	1.000	0.117	0.023
M49	0.005	-0.010	0.110	0.020	-0.038	0.020	0.054	0.117	1.000	0.098
M50	-0.044	0.013	-0.017	-0.022	0.057	0.048	0.067	0.023	0.098	1.000
M51	-0.072	0.002	-0.077	0.021	0.065	-0.078	0.198	0.113	0.05 0	0.287
M52	-0.069	0.063	-0.018	-0.002	0.021	-0.021	0.138	0.100	0.013	0.177
M53	-0.035	0.025	0.117	-0.074	-0.062	-0.011	-0.011	0.010	0.123	-0.047
M54	0.035	-0.039	0.038	0.260	0.210	0.046	0.124	0.004	-0.025	0.070
M56	-0.056	0.040	-0.073	0.031	0.036	-0.068	0.063	0.054	-0.048	0.140
M57	-0.026	-0.072	0.034	-0.003	-0.071	-0.088	0.073	0.000	0.083	-0.020

Table B.6. Yen's Q3 statistics' results for the local independence assumption.

	M51	**M52**	**M53**	**M54**	**M55**	**M56**
M1	0.070	0.047	0.045	-0.070	0.020	0.019
M2	0.069	-0.021	-0.021	-0.034	-0.060	0.017
M3	-0.061	-0.112	0.004	-0.075	-0.124	-0.031
M4	0.026	0.056	-0.045	0.017	0.053	-0.065
M5	0.043	0.052	-0.040	-0.056	-0.024	0.023
M6	0.198	0.152	-0.047	-0.040	0.106	-0.027
M7	-0.109	-0.08 1	0.005	-0.042	-0.146	-0.109
M8	-0.103	-0.084	0.024	-0.036	-0.112	-0.028
M9	-0.129	-0.145	0.062	-0.135	-0.095	-0.040
M10	0.011	0.015	0.038	-0.078	-0.028	-0.038
M11	-0.101	-0.090	0.052	-0.032	-0.172	-0.074
M12	-0.090	-0.061	-0.054	-0.094	-0.136	-0.113
M 3	-0.003	0.017	0.022	-0.015	0.058	-0.016
M14	-0.053	-0.03 0	0.000	-0.057	-0.097	-0.019
M15	-0.044	0.055	-0.028	-0.056	-0.010	-0.18 0
M16	0.025	0.085	-0.026	0.035	0.024	0.010
M17	-0.010	-0.070	0.015	-0.138	-0.046	-0.089
M18	0.006	-0.017	-0.001	-0.039	-0.022	-0.057
M19	-0.014	-0.035	0.003	-0.067	-0.039	-0.027

Table B.6. Yen's Q3 statistics' results for the local independence assumption. (cont.)

	M51	**M52**	**M53**	**M54**	**M55**	**M56**
M20	-0.131	-0.132	-0.073	-0.183	-0.066	-0.025
M21	-0.070	-0.092	0.006	-0.179	-0.110	-0.047
M22	-0.056	-0.009	-0.008	-0.085	-0.029	-0.027
M23	-0.05 1	-0.060	-0.039	-0.146	-0.110	0.047
M24	-0.142	-0.047	-0.05 0	0.143	-0.015	-0.077
M25	-0.012	-0.015	-0.171	0.026	0.094	-0.059
M26	-0.065	-0.090	-0.076	-0.062	-0.027	-0.043
M27	-0.065	-0.155	-0.041	-0.126	-0.088	-0.029
M28	-0.03 0	-0.099	0.046	-0.008	0.027	-0.094
M29	-0.010	0.014	-0.018	0.020	0.063	-0.096
M30	-0.090	-0.041	-0.066	0.014	0.072	-0.087
M31	0.009	0.040	-0.035	-0.027	-0.003	-0.061
M32	0.075	-0.008	-0.002	-0.08 1	-0.022	0.036
M33	0.007	-0.034	0.069	-0.047	-0.085	0.074
M34	0.049	0.070	-0.076	-0.053	0.071	0.059
M35	-0.067	-0.062	0.098	-0.034	-0.074	0.200
M36	-0.056	-0.028	-0.058	-0.021	0.007	0.128
M37	-0.031	0.055	-0.060	0.041	0.086	-0.074
M38	-0.091	0.066	-0.082	0.020	0.022	-0.053
M39	0.122	0.182	-0.012	0.005	0.049	-0.014
M40	0.113	0.094	-0.069	0.048	0.28 1	-0.014

Table B.6. Yen's Q3 statistics' results for the local independence assumption. (cont.)

	M51	**M52**	**M53**	**M54**	**M55**	**M56**
M	-0.072	-0.069	-0.035	0.035	-0.056	-0.026
M42	0.002	0.063	0.025	-0.039	0.040	-0.072
M43	-0.077	-0.018	0.117	0.038	-0.073	0.034
M44	0.021	-0.002	-0.074	0.260	0.031	-0.003
M45	0.065	0.021	-0.062	0.210	0.036	-0.071
M46	-0.078	-0.021	-0.011	0.046	-0.068	-0.088
M47	0.198	0.138	-0.011	0.124	0.063	0.073
M48	0.113	0.100	0.010	0.004	0.054	0.000
M49	0.05 0	0.013	0.123	-0.025	-0.048	0.083
M50	0.287	0.177	-0.047	0.070	0.140	-0.020
M51	1.000	0.184	-0.019	0.017	0.102	0.031
M52	0.184	1.000	-0.040	0.133	0.178	0.011
M53	-0.019	-0.040	1.000	0.016	-0.101	0.138
M54	0.017	0.133	0.016	1.000	0.119	0.015
M56	0.102	0.178	-0.101	0.119	1.000	0.084
M57	0.031	0.011	0.138	0.015	0.084	1.000

APPENDIX C: ITEM CHARACTERISTICS CURVES

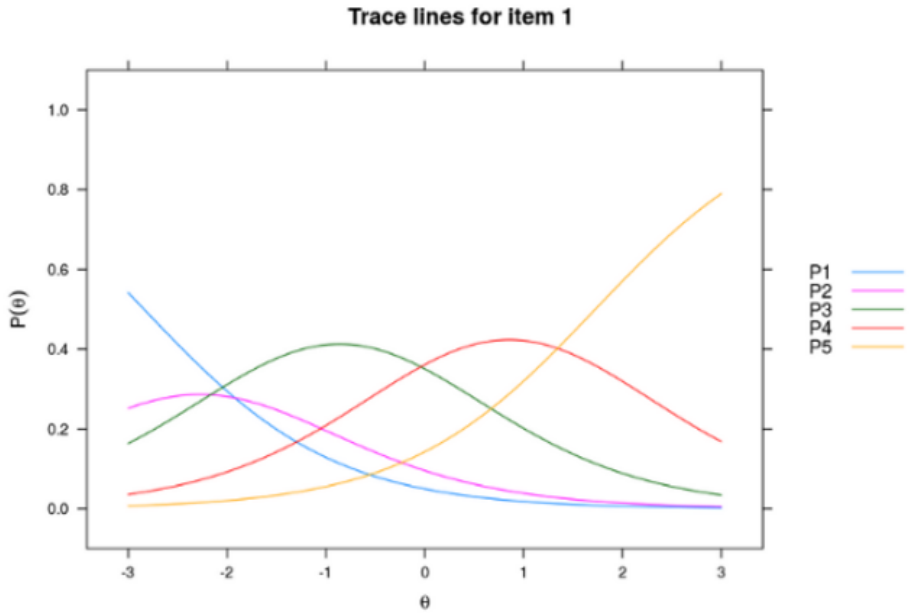

Figure C.1. Item characteristics curves 1.

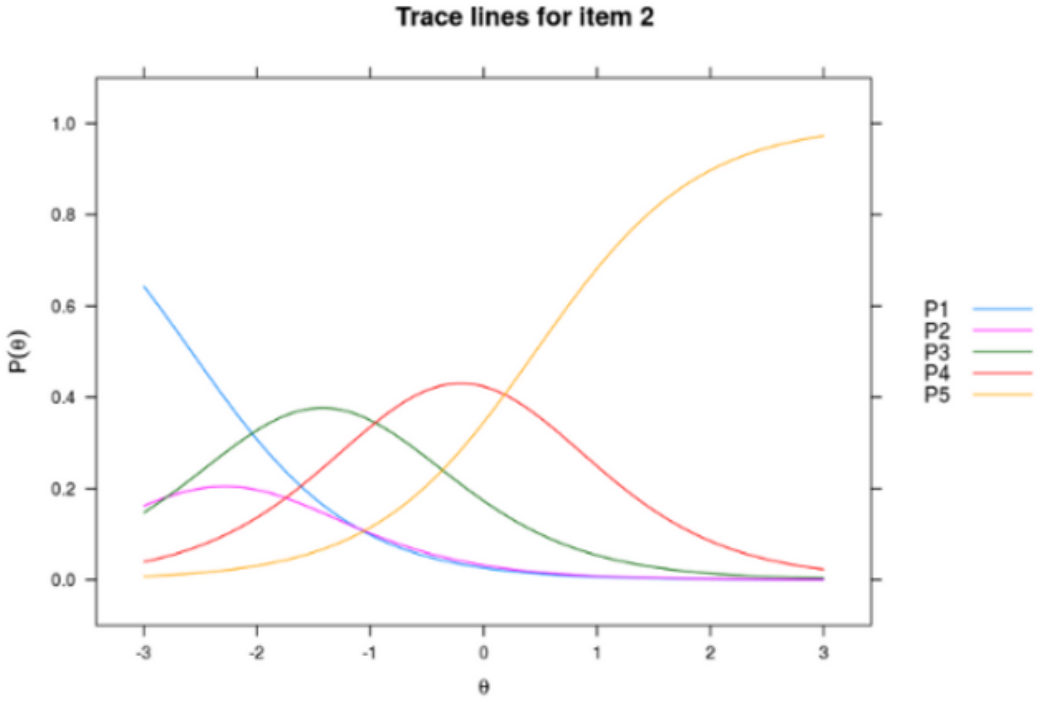

Figure C.2. Item characteristics curves 2.

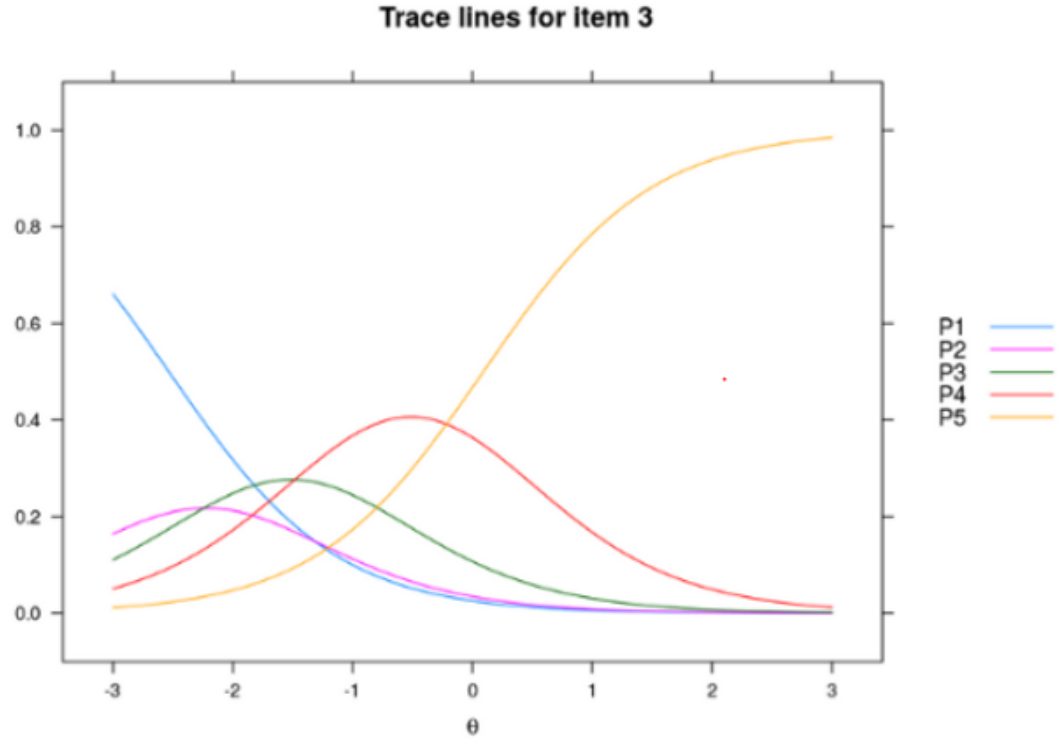

Figure C.3. Item characteristics curves 3.

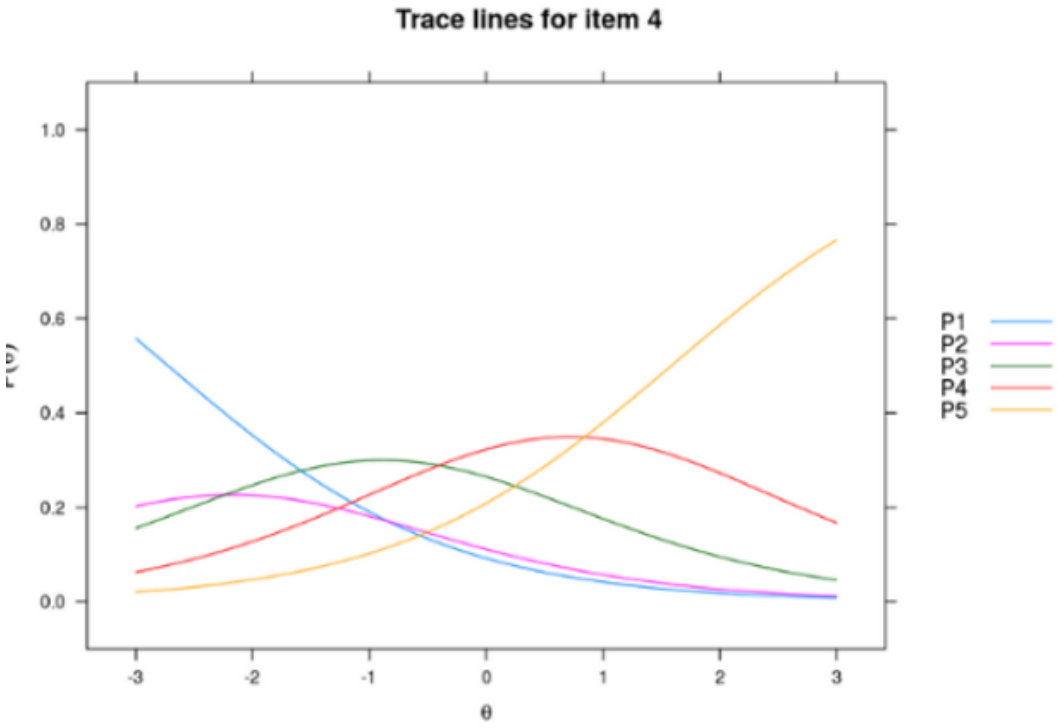

Figure C.4. Item caractceristics curves 4.

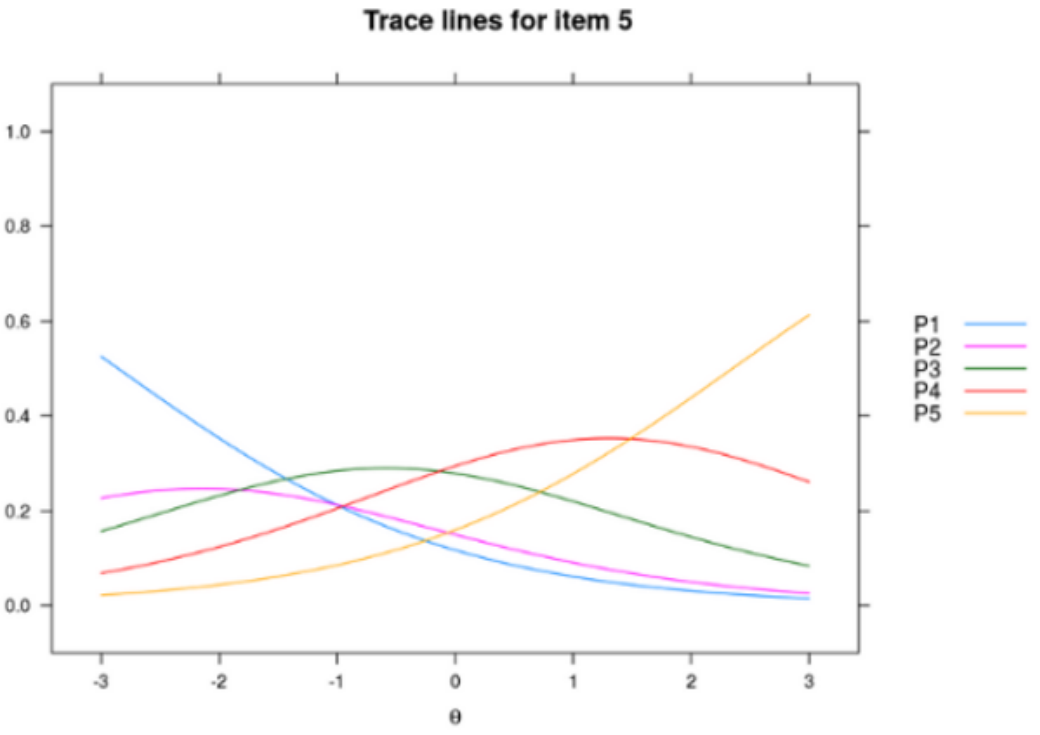

Figure C.5. Item characteristics curves 5.

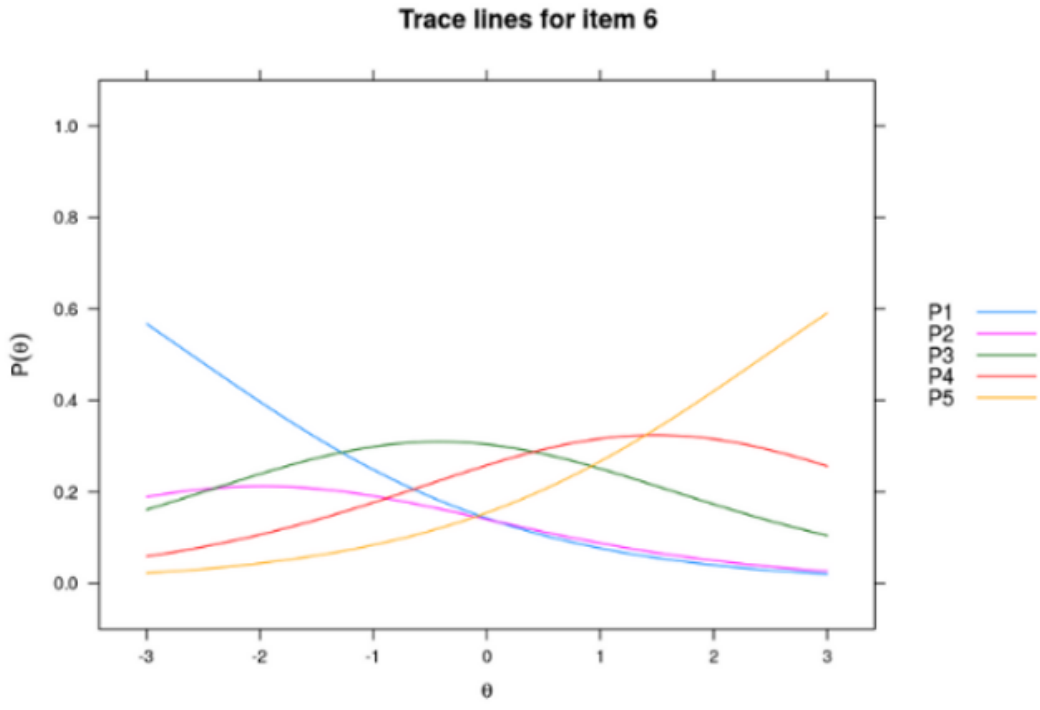

Figure C.6. Item characteristics curves 6.

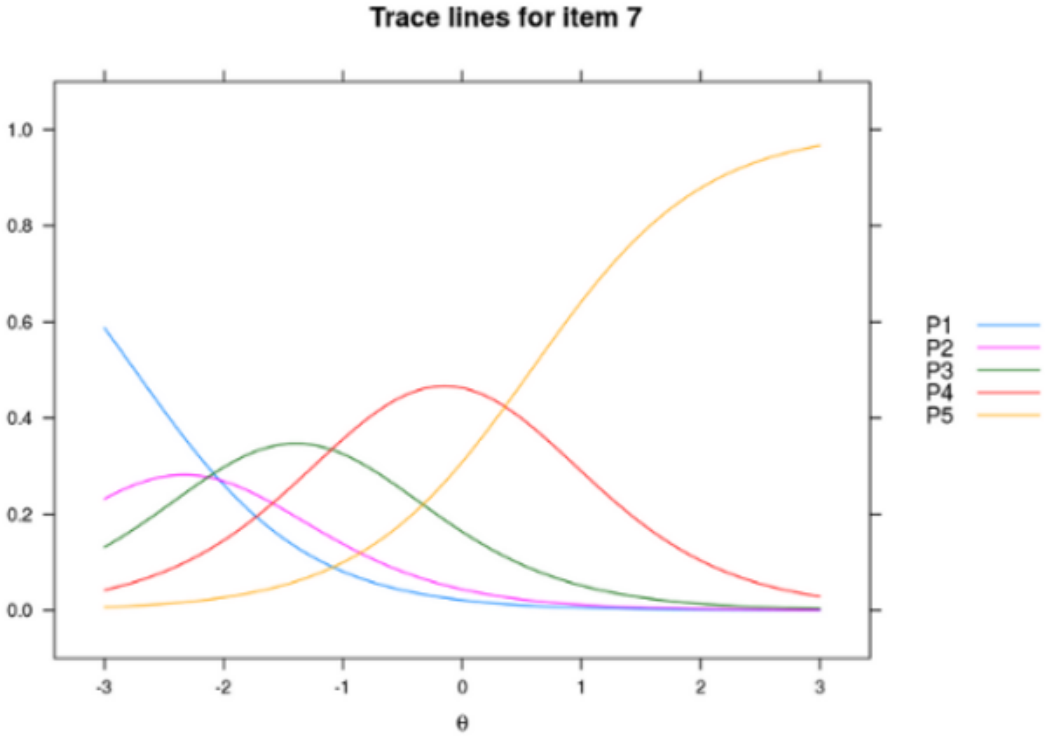

Figure C.7. Item characteristics curves 7.

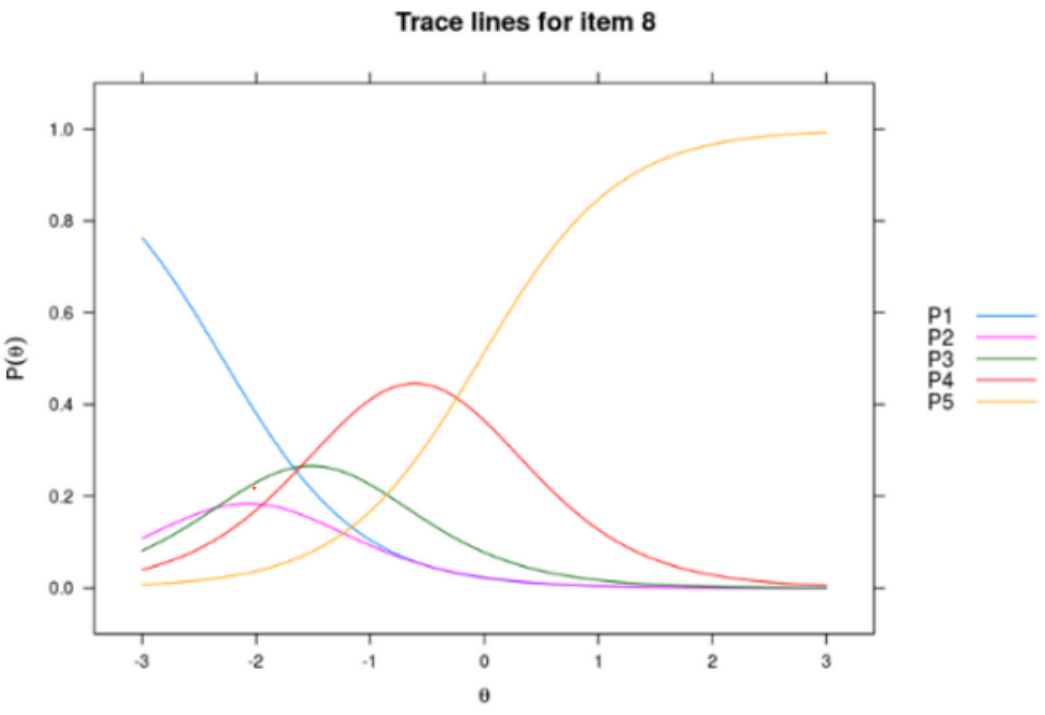

Figure C.8. Item characteristics curves 8.

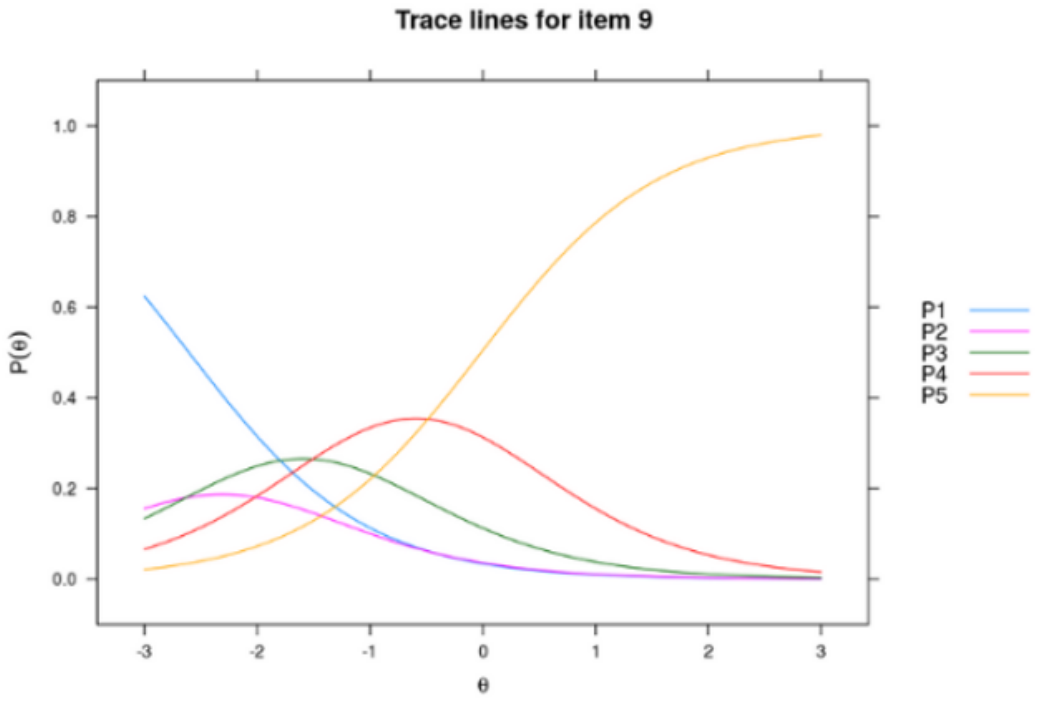

Figure C.9. Item characteristics curves 9.

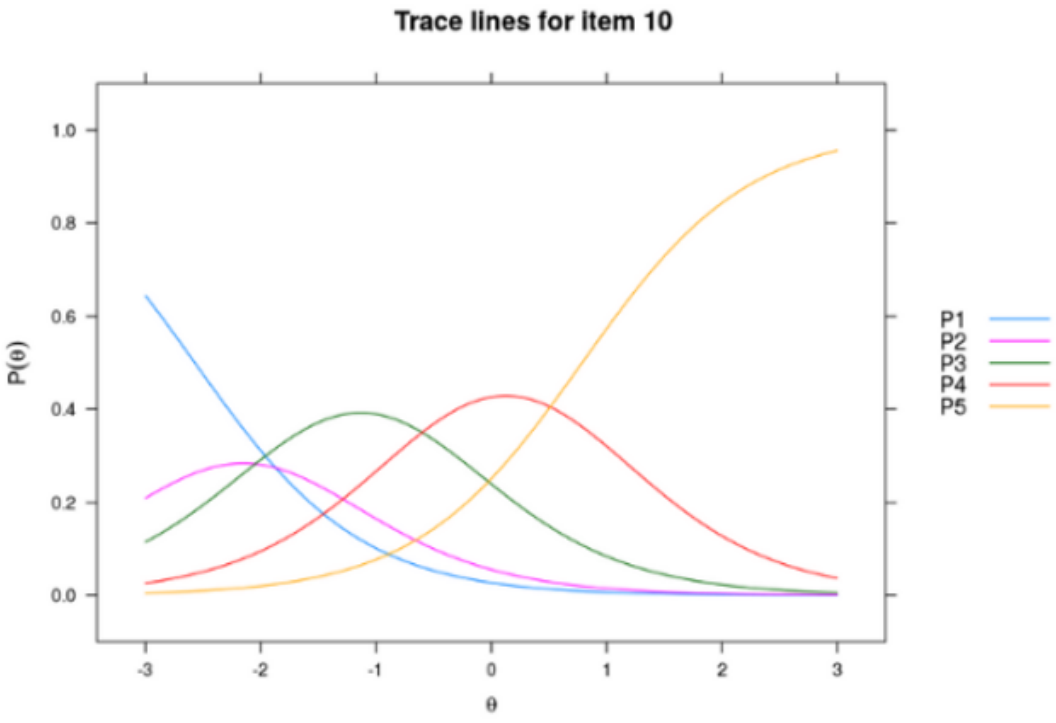

Figure C.10. Item characteristics curves 10.

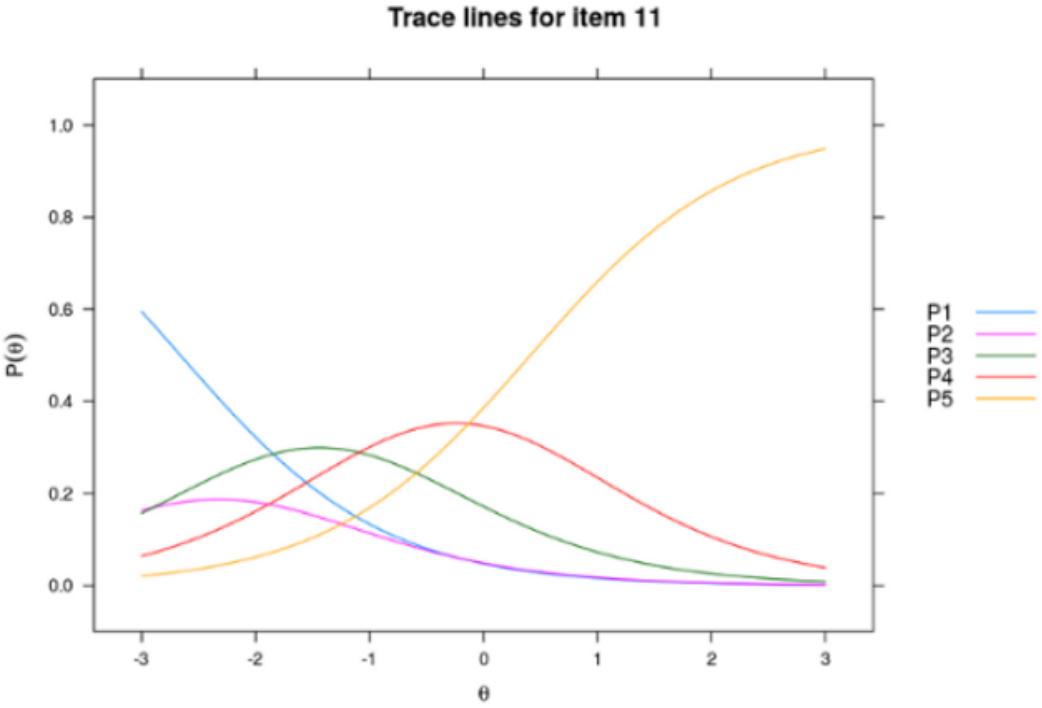

Figure C.11. Item characteristics curves 11.

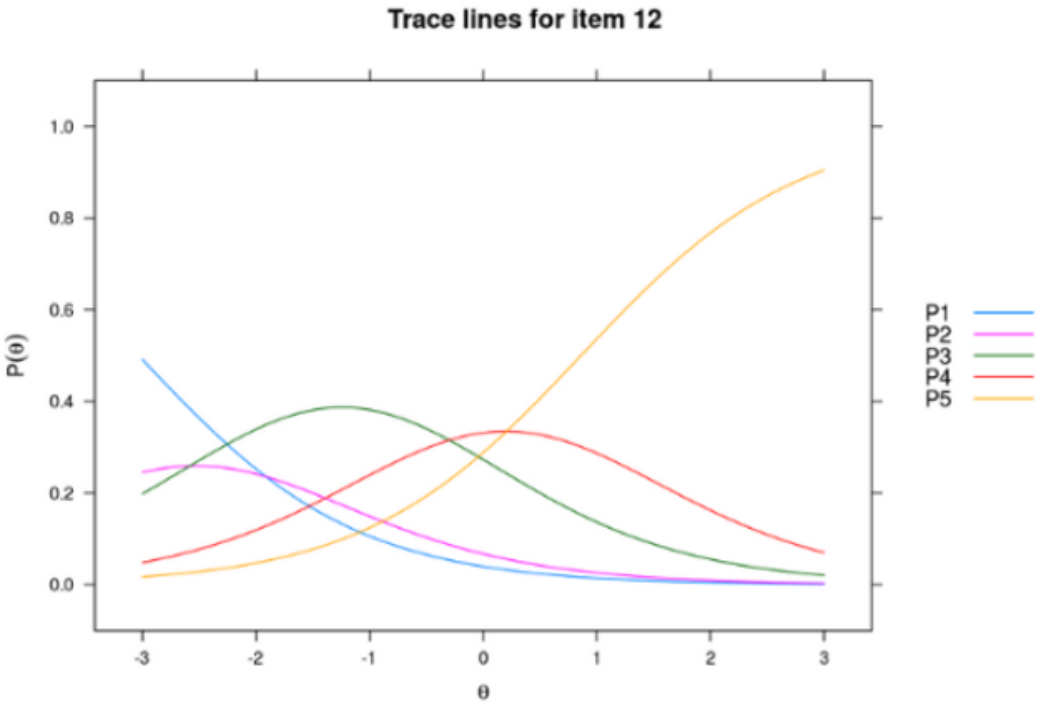

Figure C.12. Item characteristics curves 12.

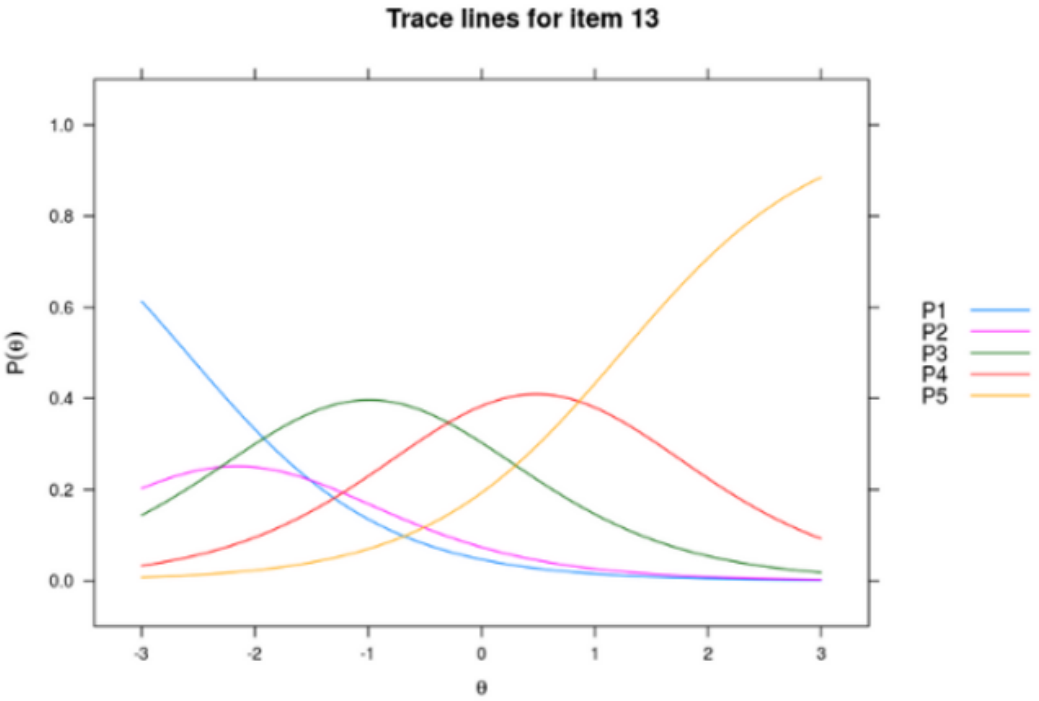

Figure C.13. Item characteristics curves 13.

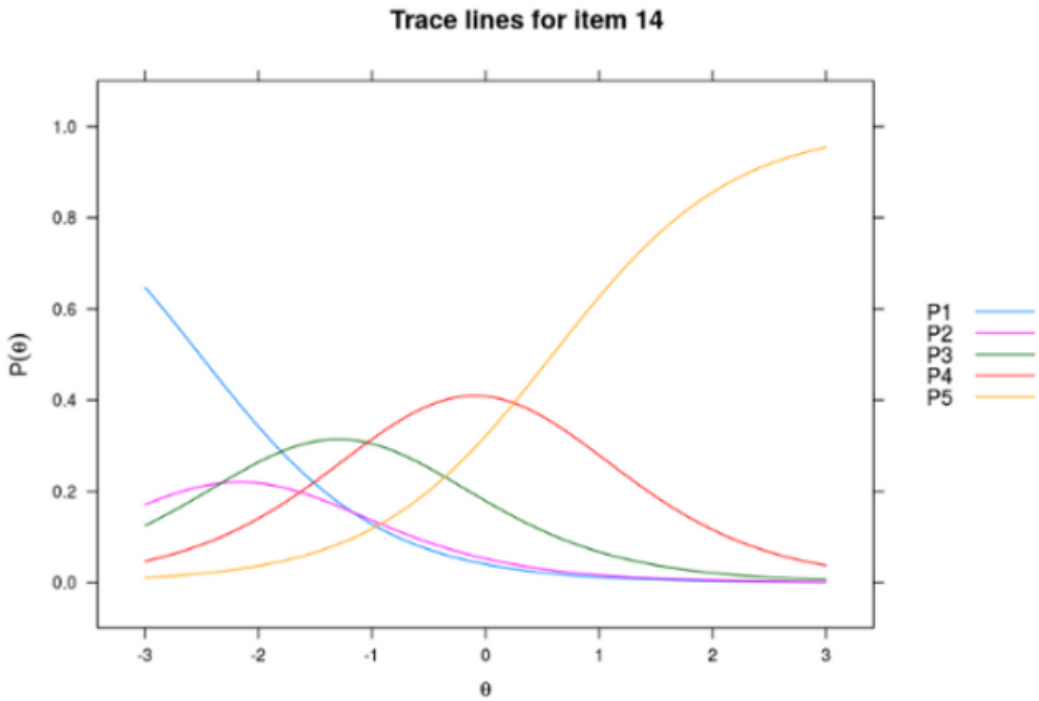

Figure C.14. Item characteristics curves 14.

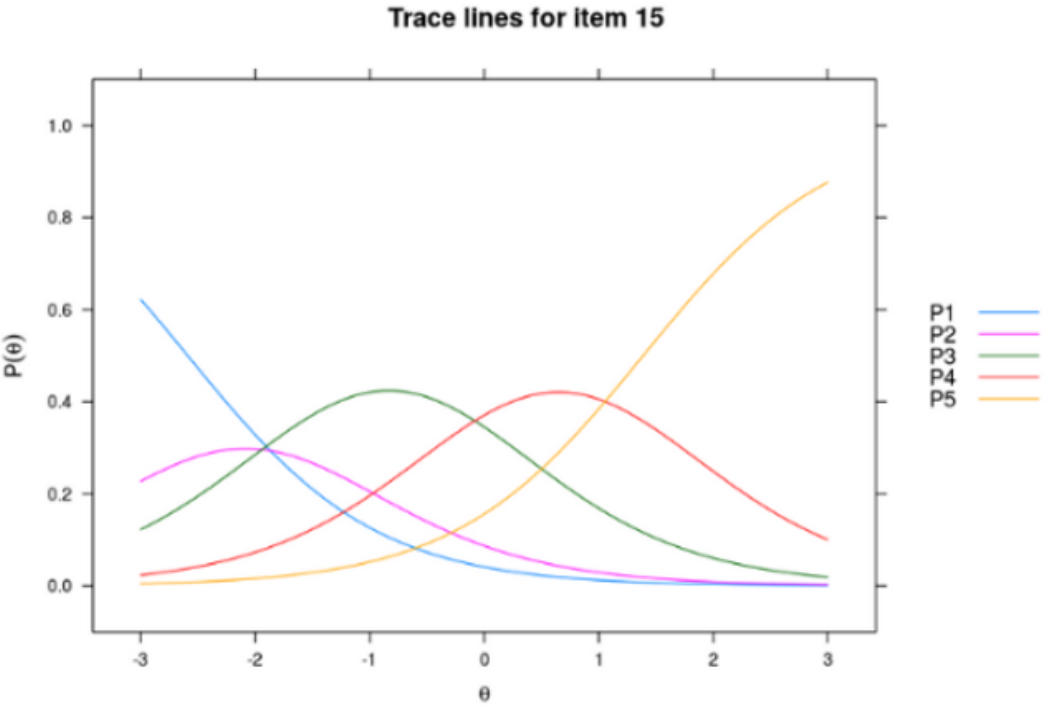

Figure C.15. Item characteristics curves 15.

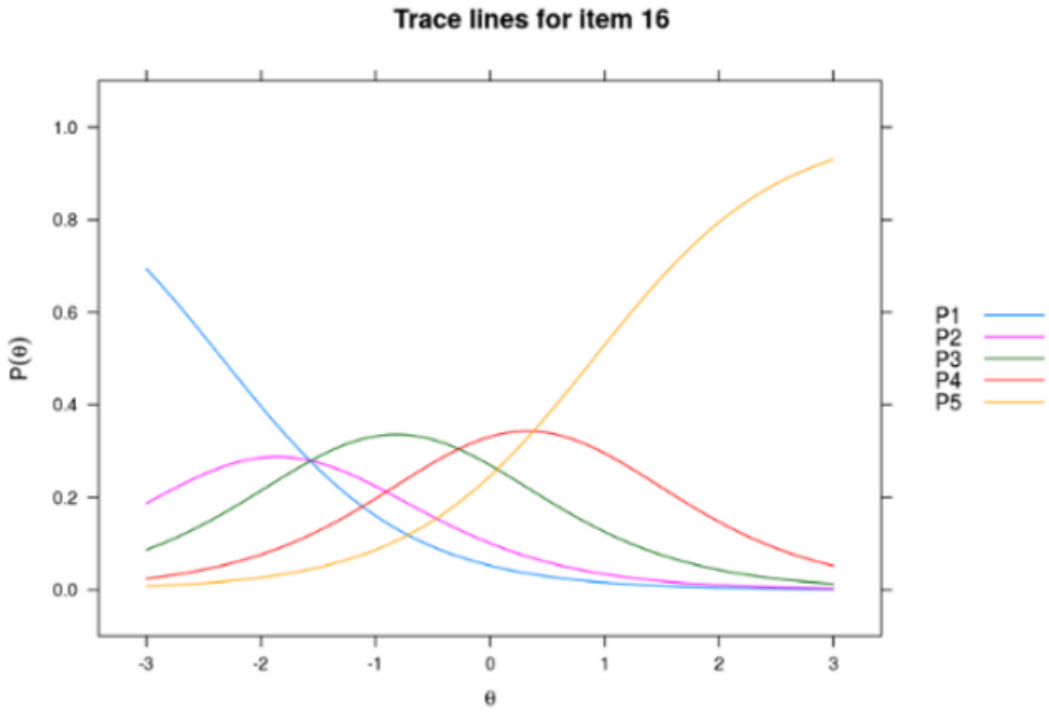

Figure C.16. Item characteristics curves 16.

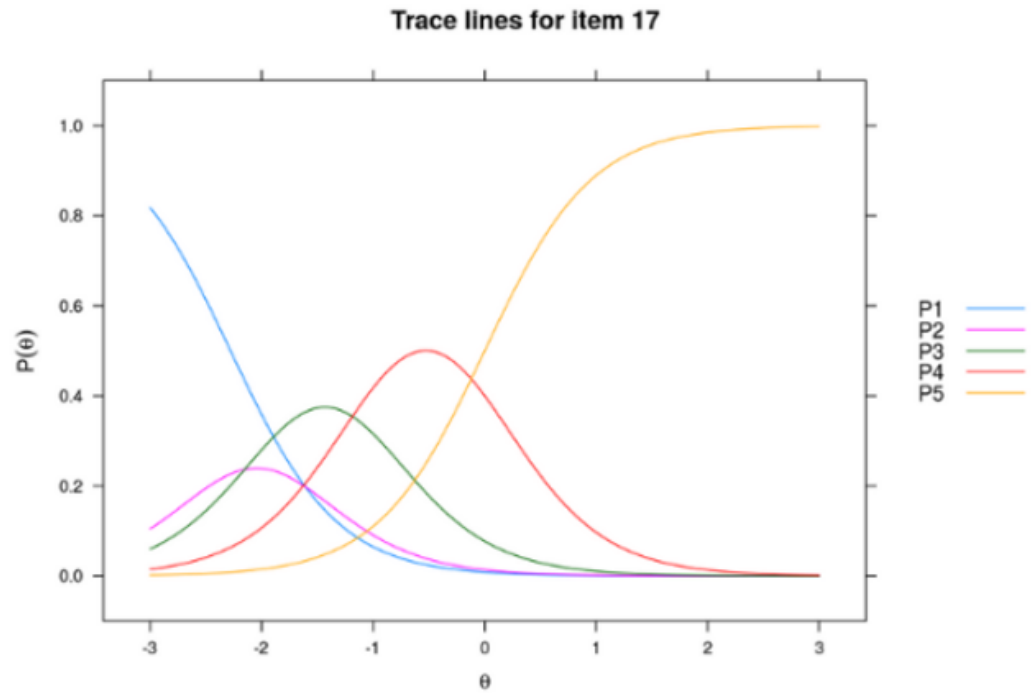

Figure C.17. Item characteristics curves 17.

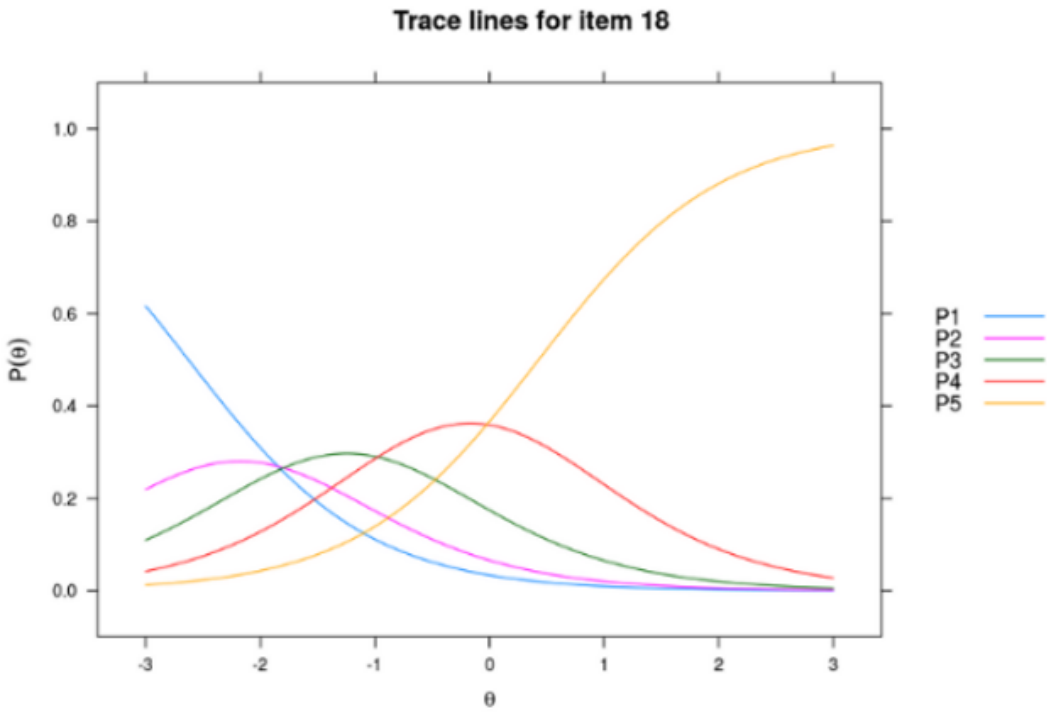

Figure C.18. Item characteristics curves 18.

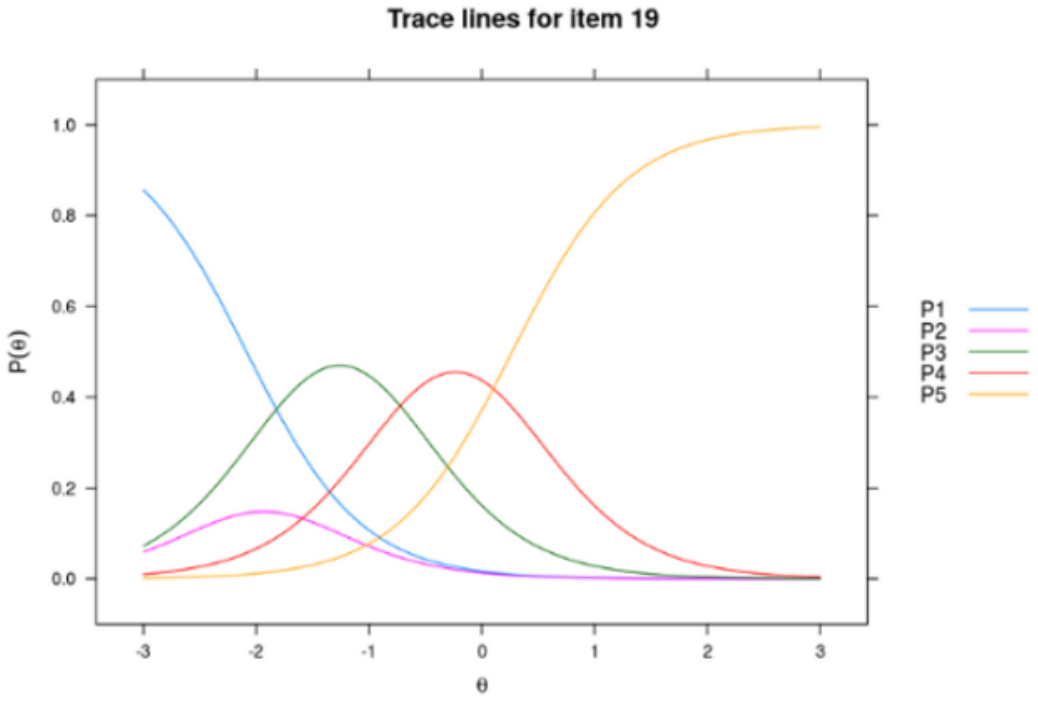

Figure C.19. Item characteristics curves 19.

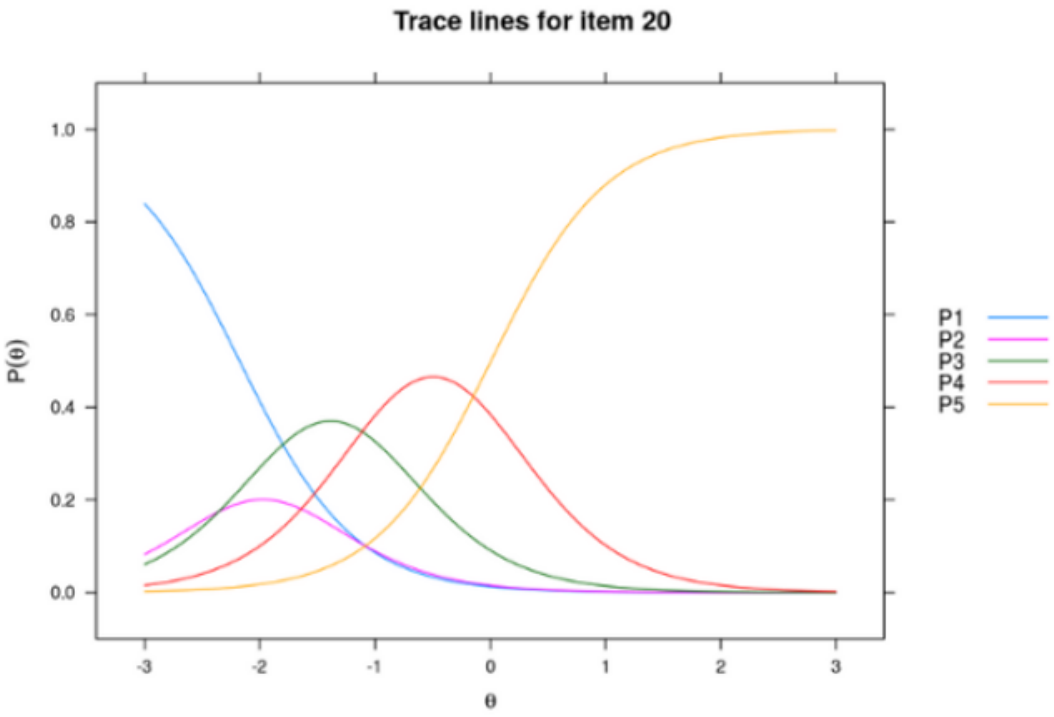

Figure C.20. Item characteristics curves 20.

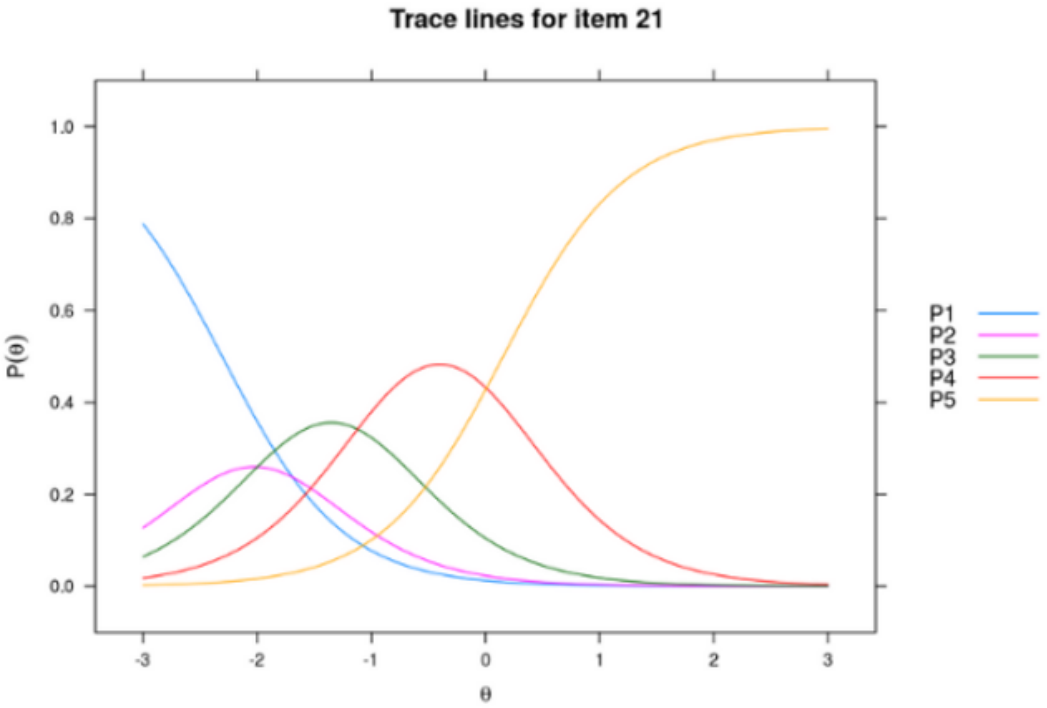

Figure C.21. Item characteristics curves 21.

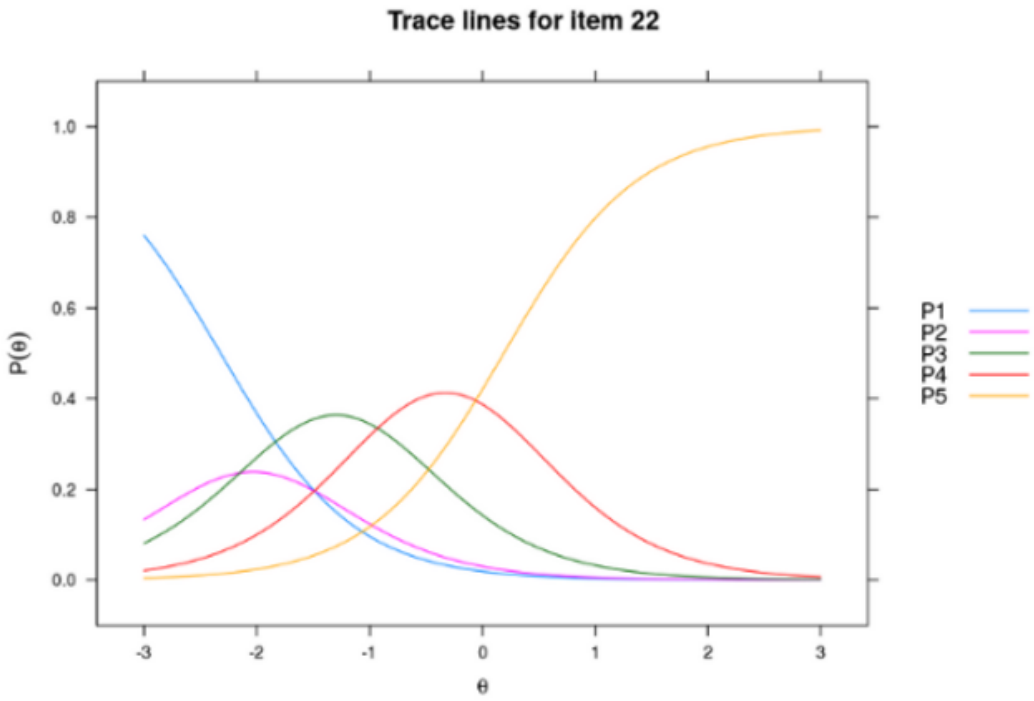

Figure C.22. Item characteristics curves 22.

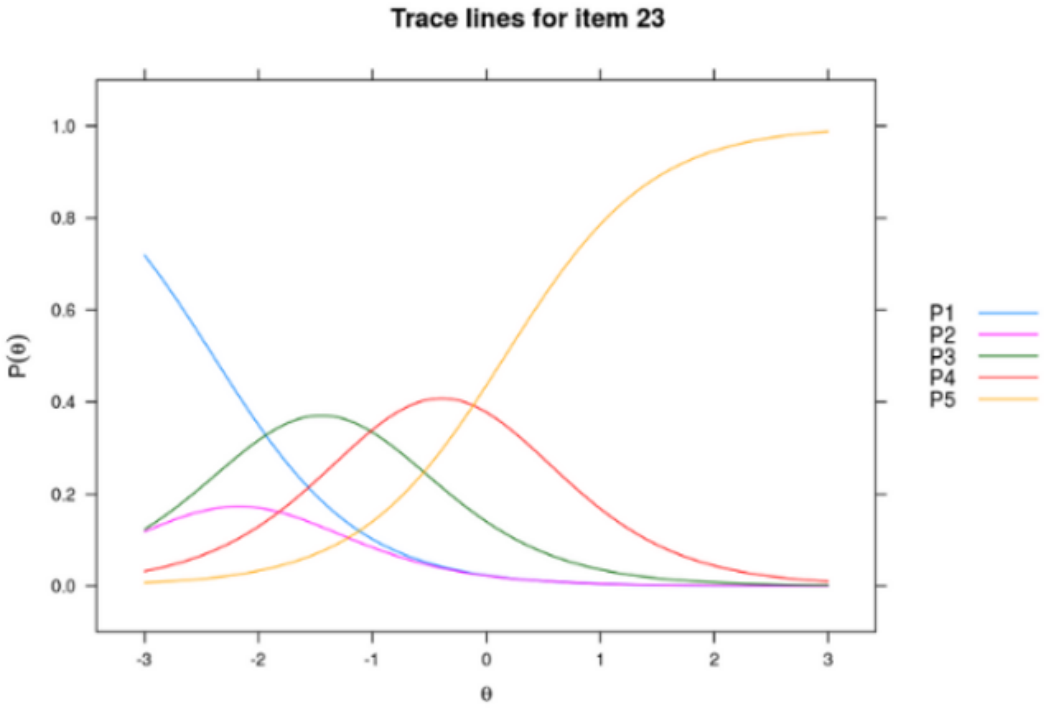

Figure C.23. Item characteristics curves 23.

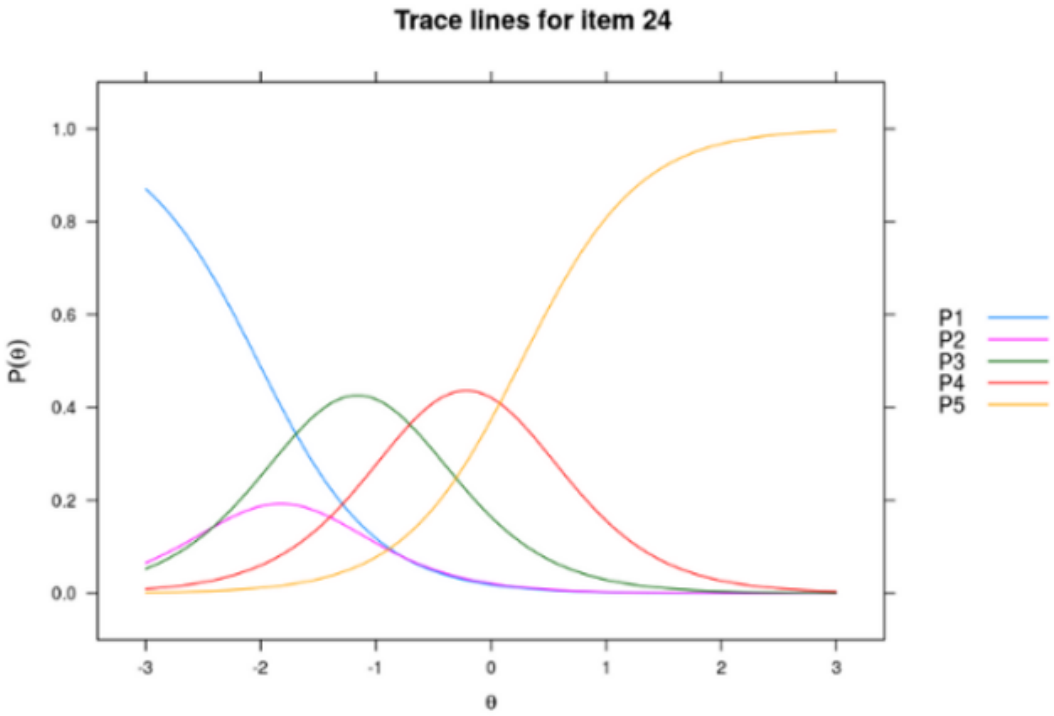

Figure C.24. Item characteristics curves 24.

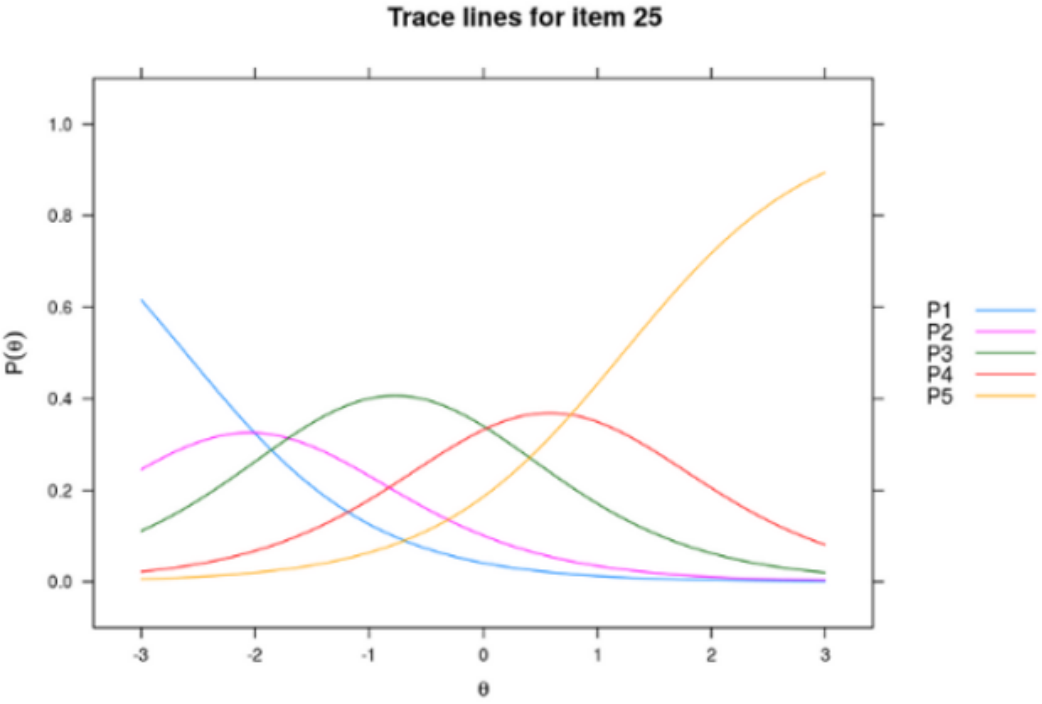

Figure C.25. Item characteristics curves 25.

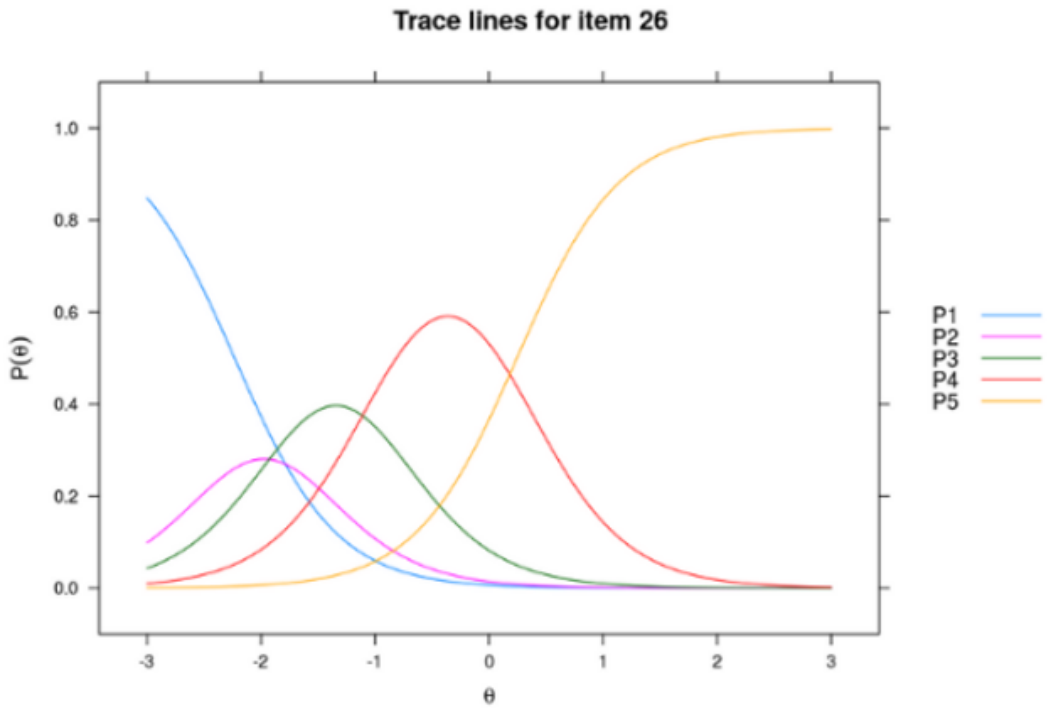

Figure C.26. Item characteristics curves 26.

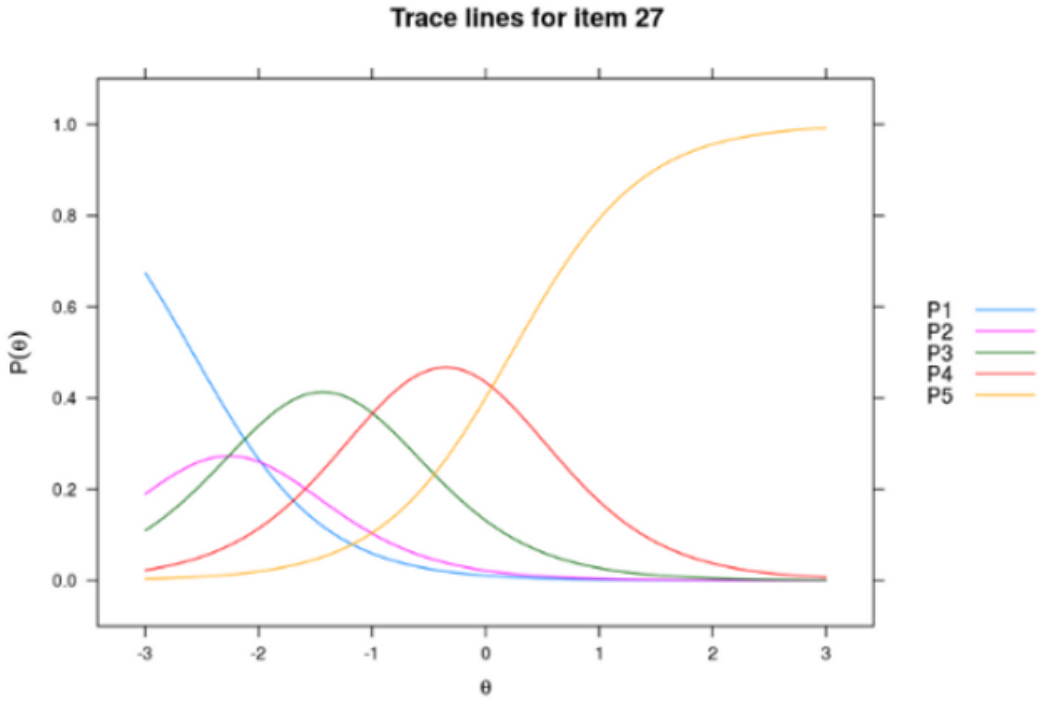

Figure C.27. Item characteristics curves 27.

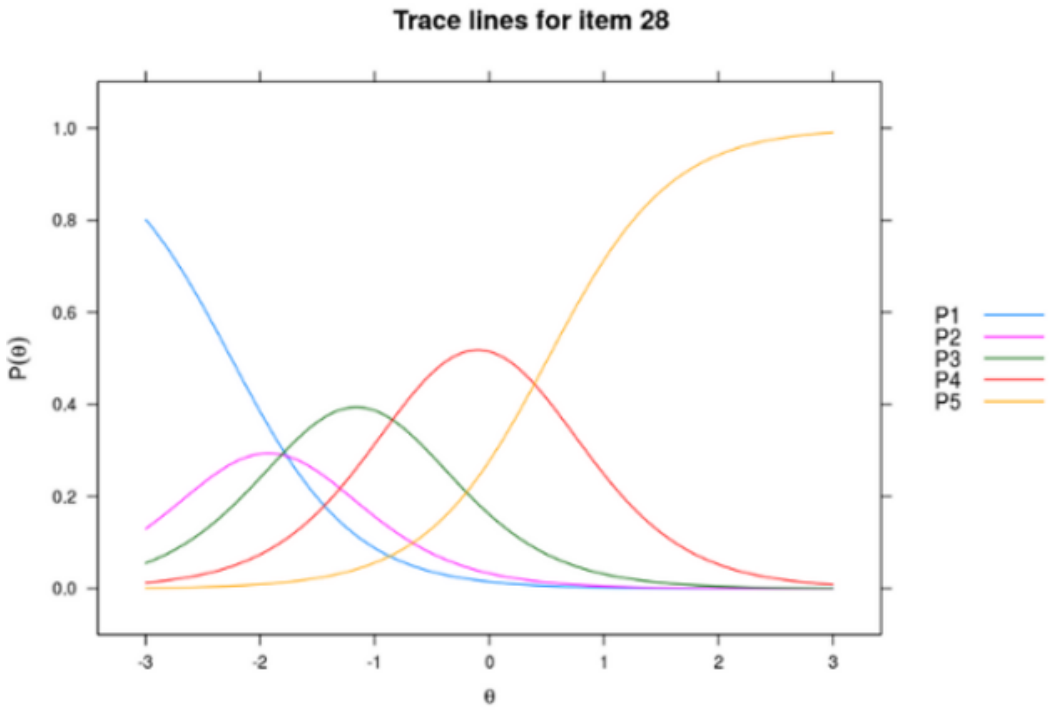

Figure C.28. Item characteristics curves 28.

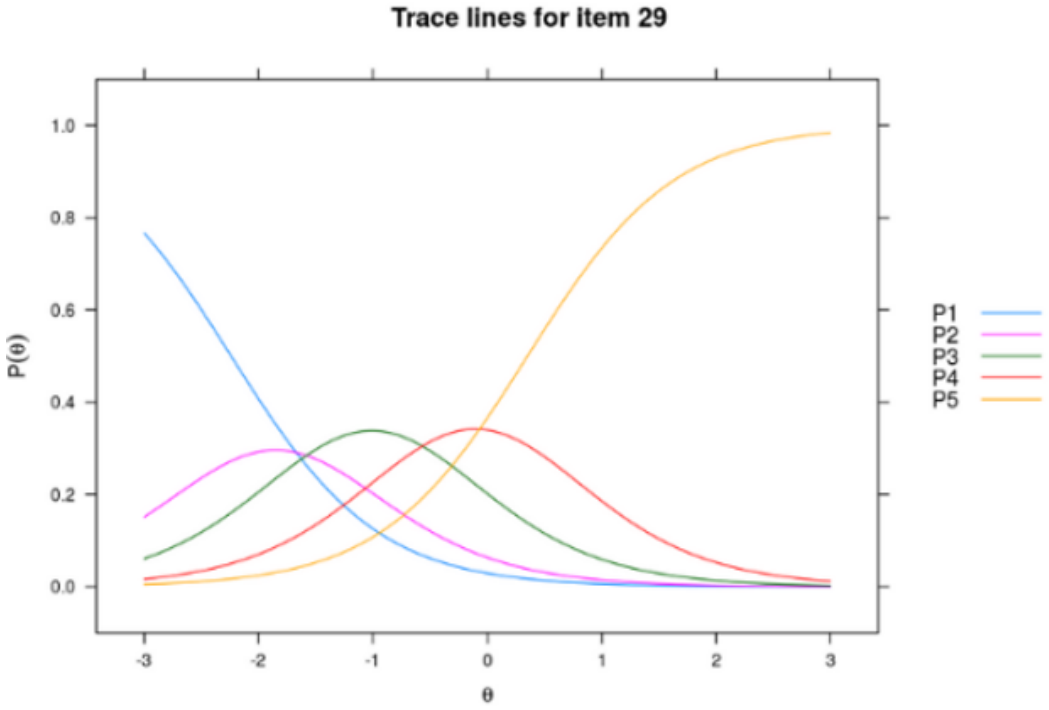

Figure C.29. Item characteristics curves 29.

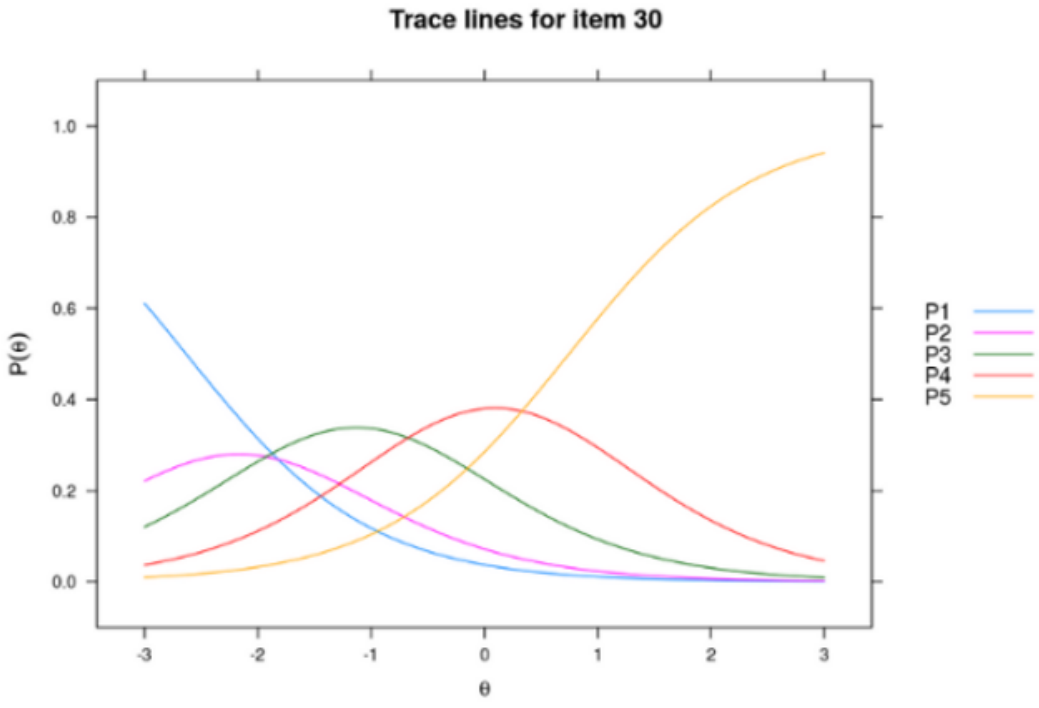

Figure C.30. Item characteristics curves 30.

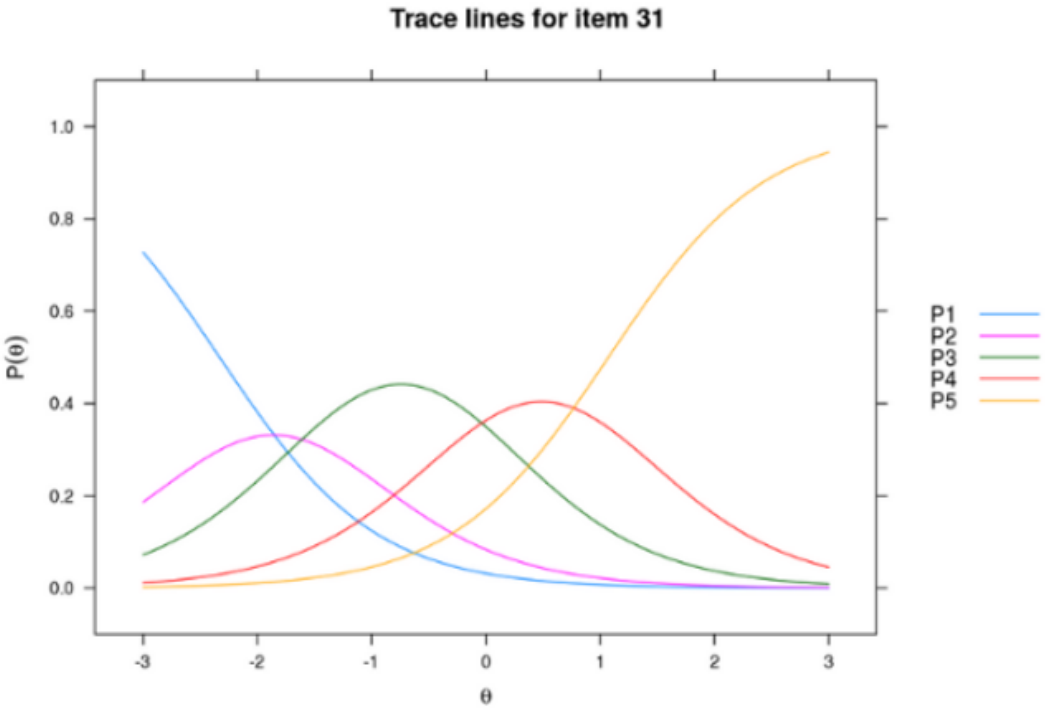

Figure C.31. Item characteristics curves 31.

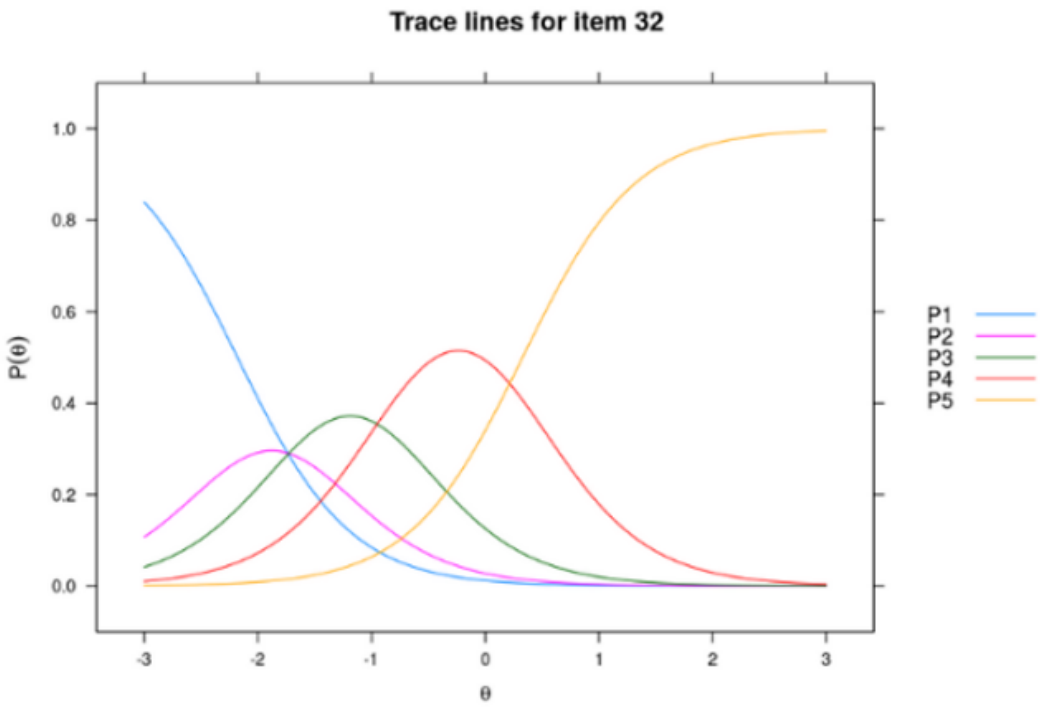

Figure C.32. Item characteristics curves 32.

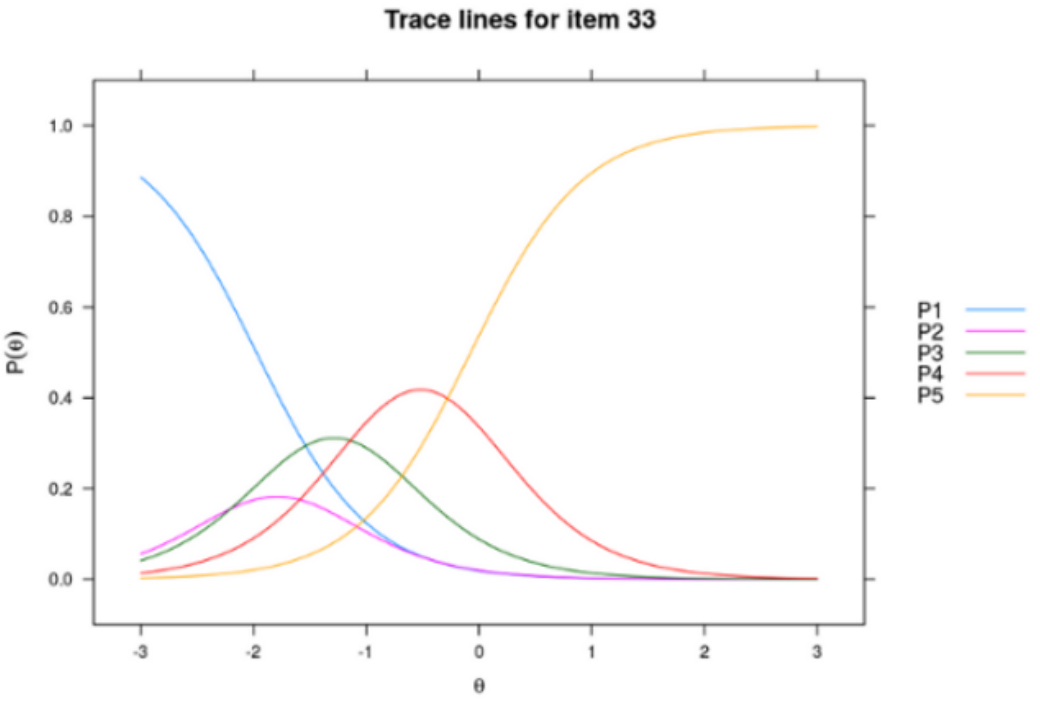

Figure C.33. Item characteristics curves 33.

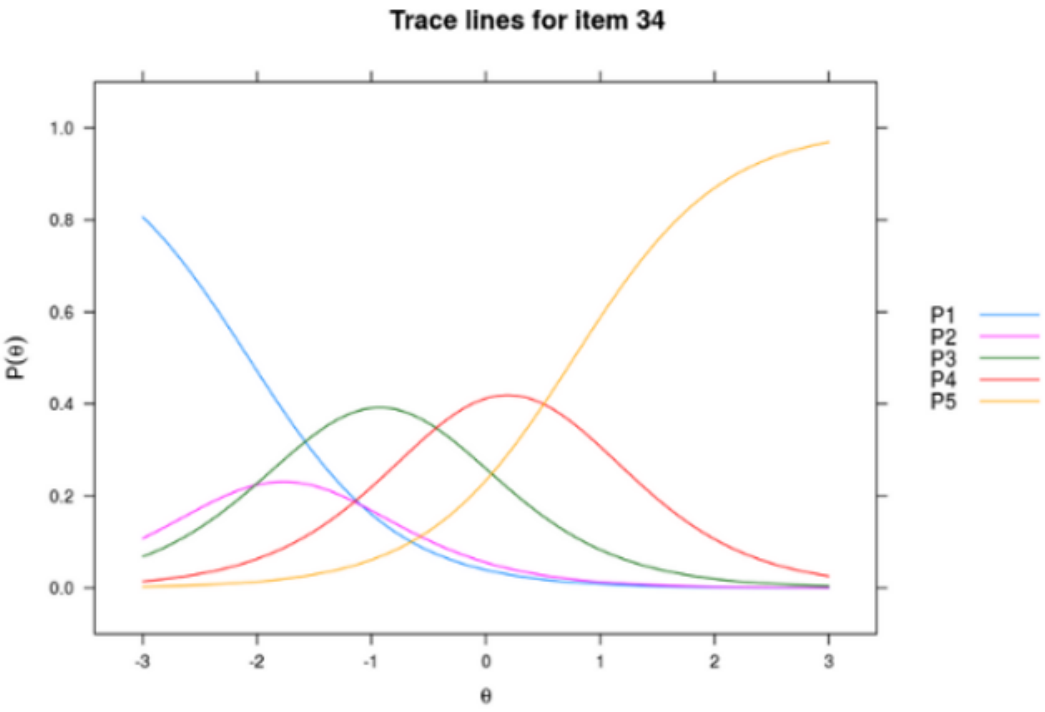

Figure C.34. Item characteristics curves 34.

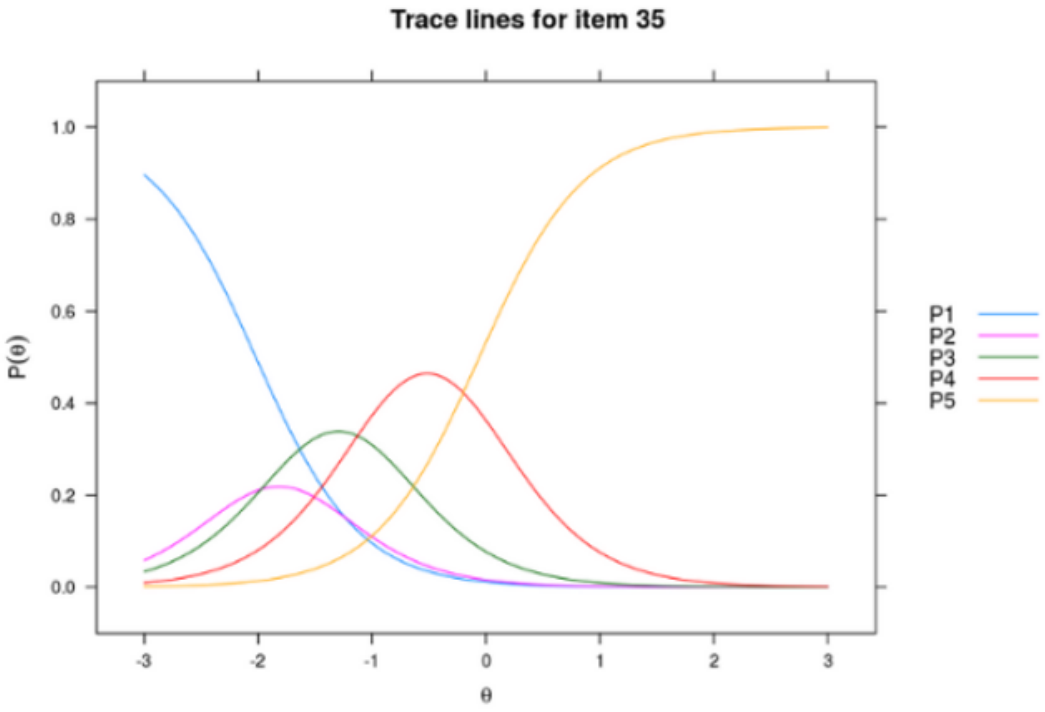

Figure C.35. Item characteristics curves 35.

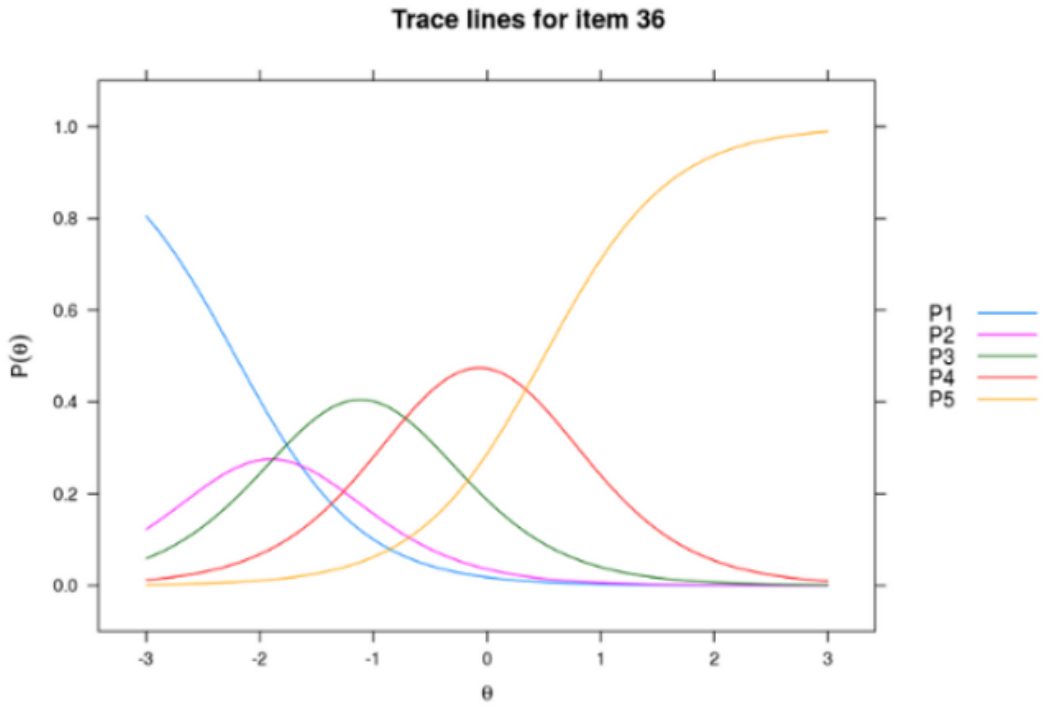

Figure C.36. Item characteristics curves 36.

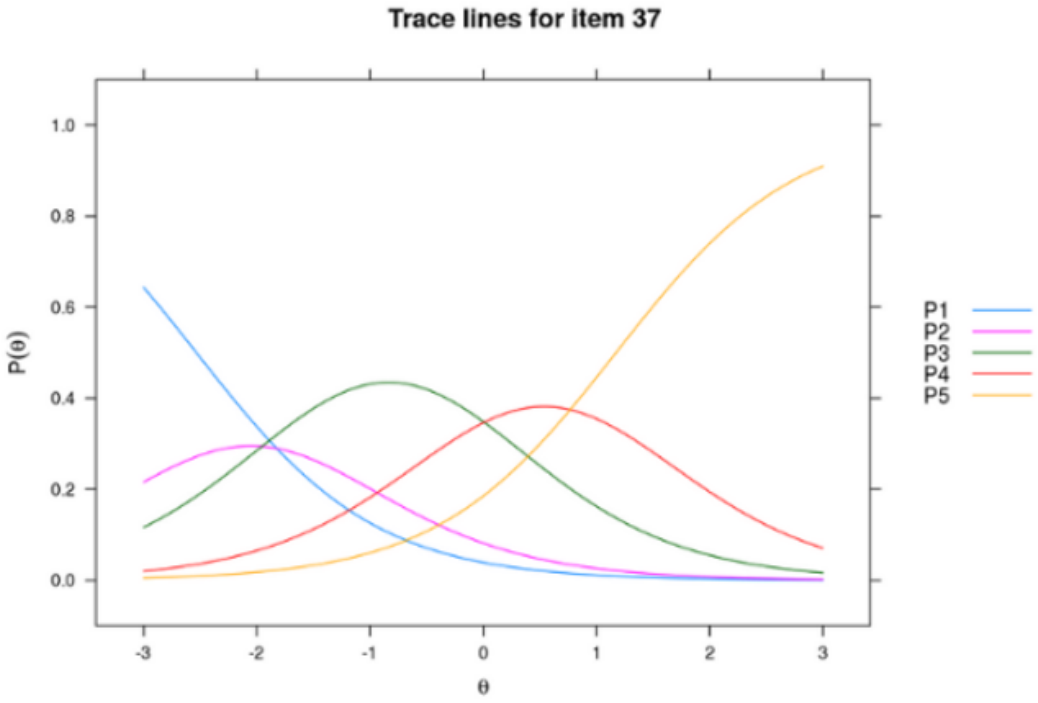

Figure C.37. Item characteristics curves 37.

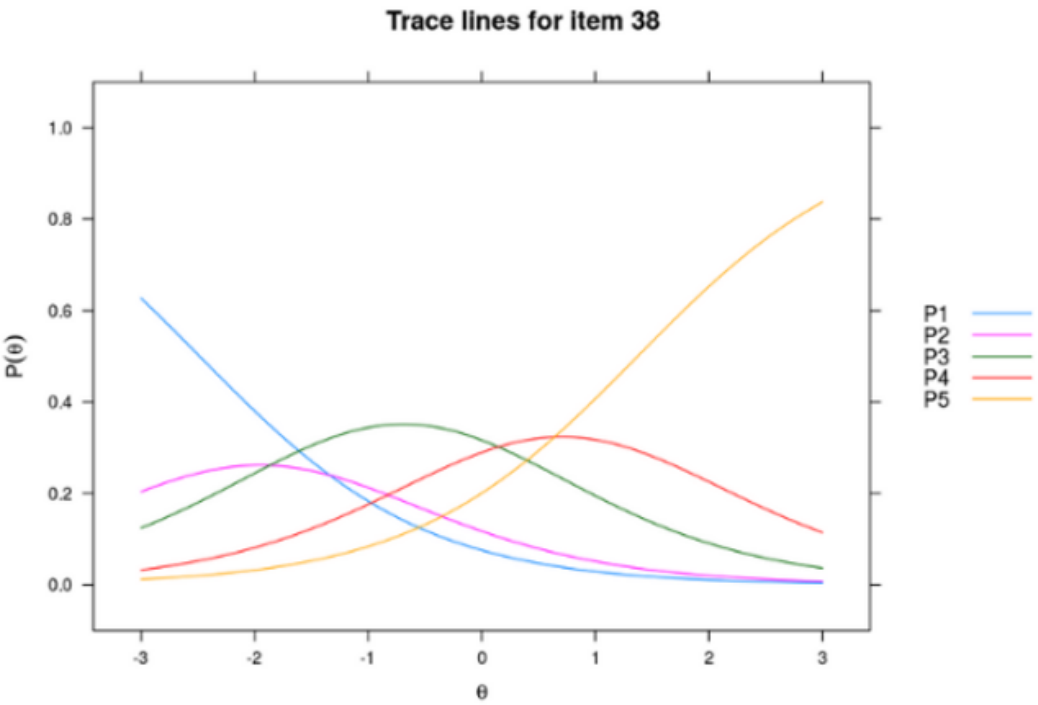

Figure C.38. Item characteristics curves 38.

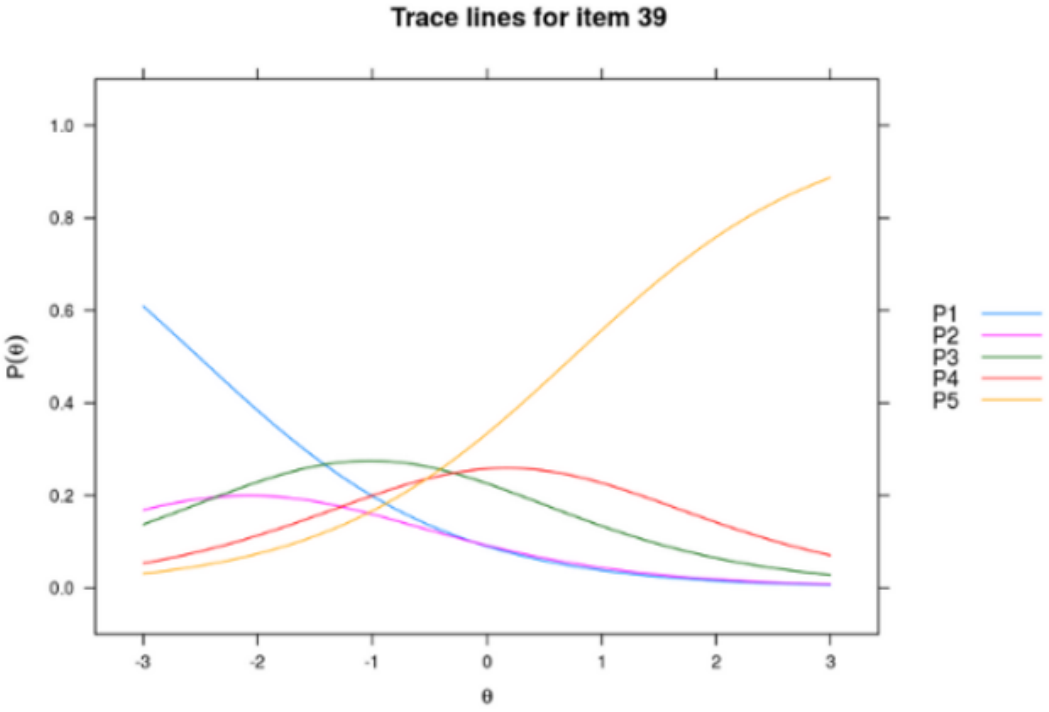

Figure C.39. Item characteristics curves 39.

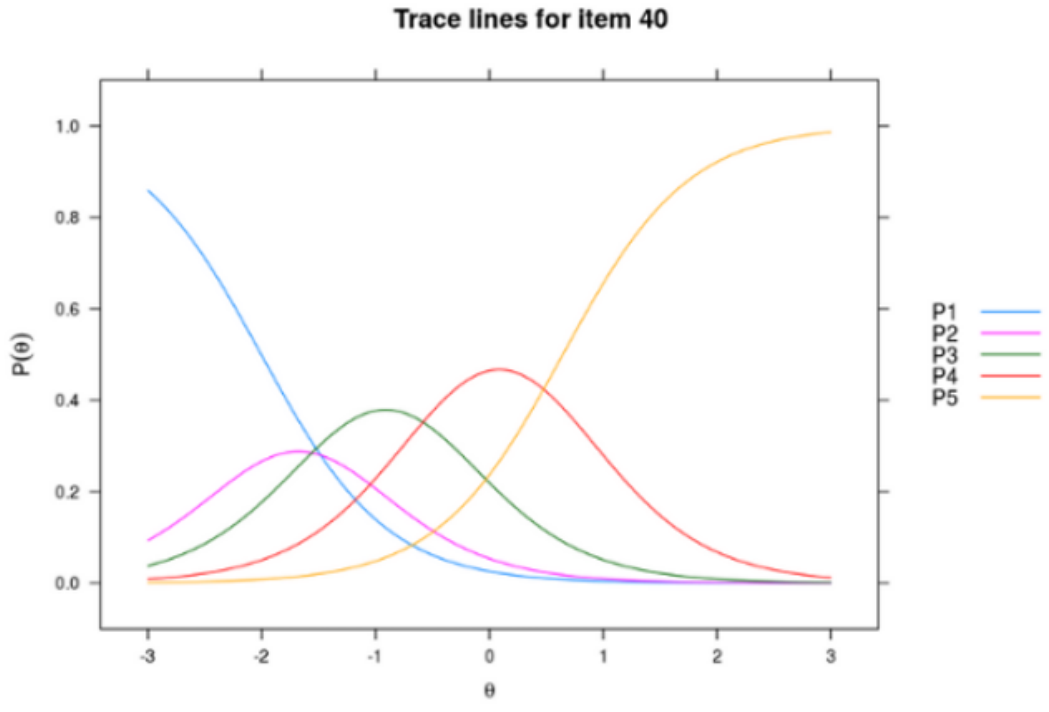

Figure C.40. Item characteristics curves 40.

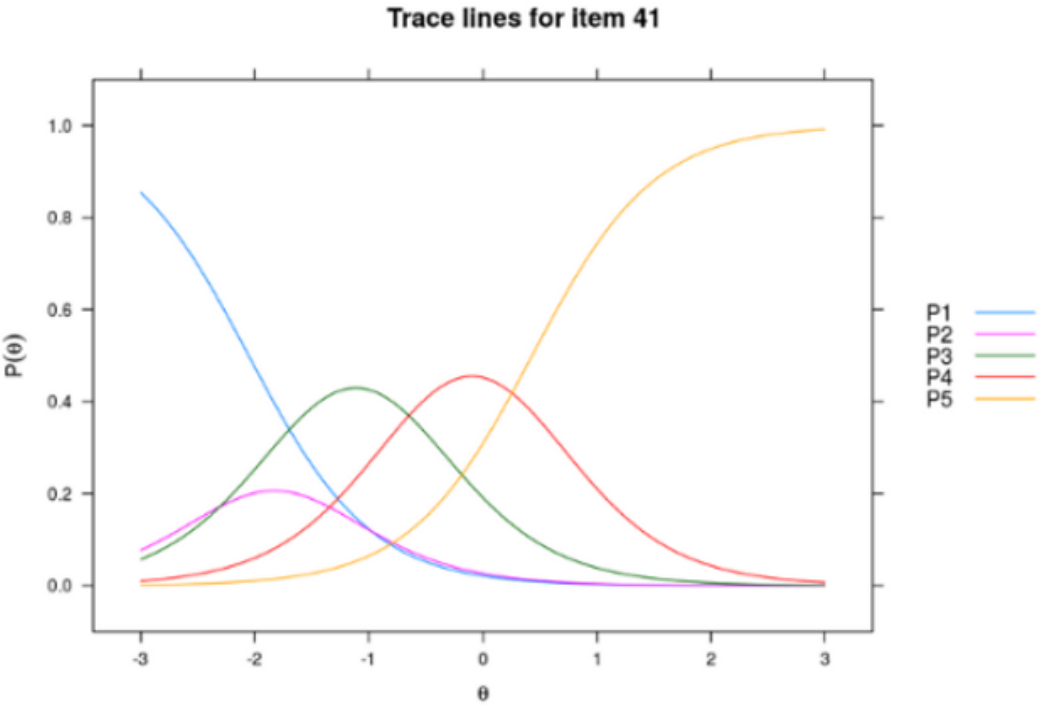

Figure C.41. Item characteristics Curves 41.

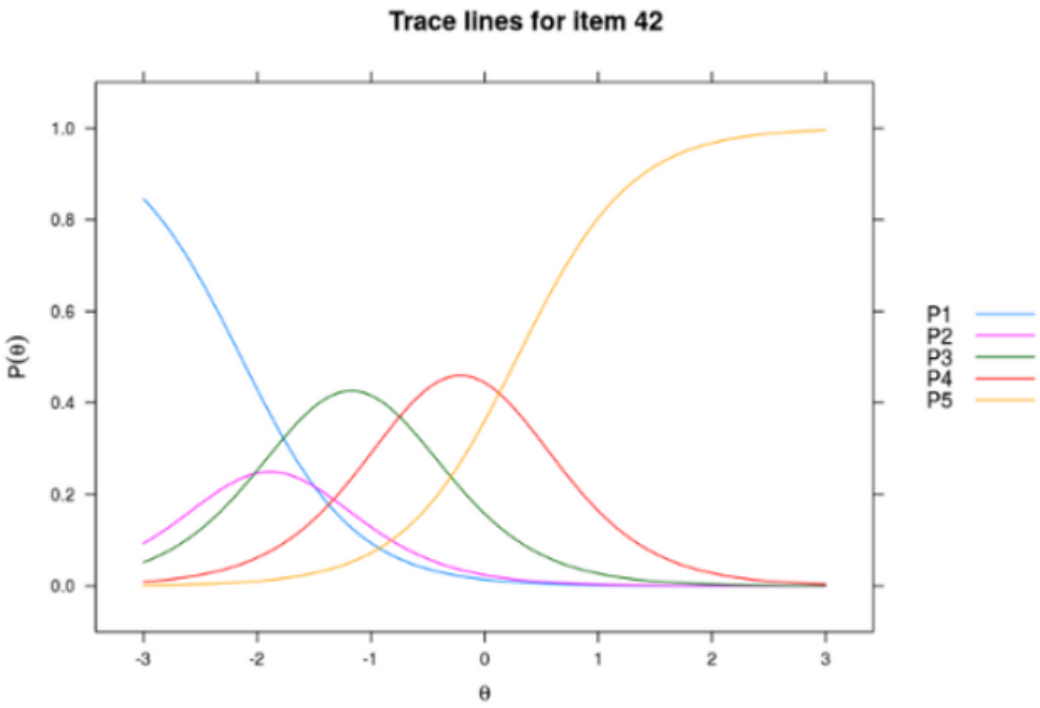

Figure C.42. Item characteristics curves 42.

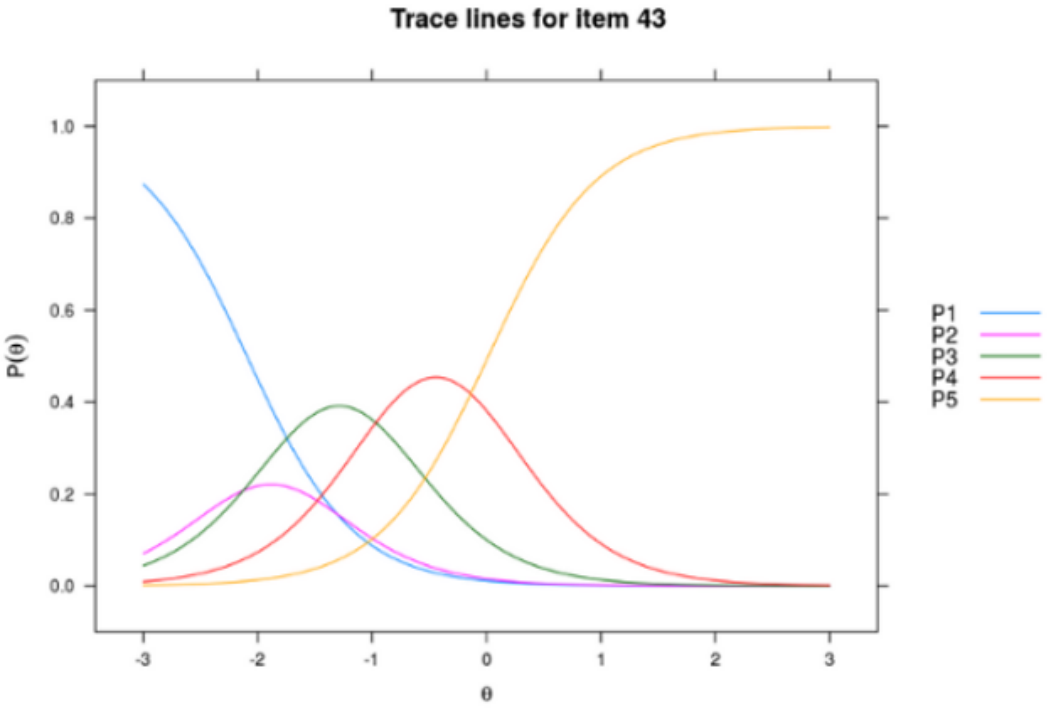

Figure C.43. Item characteristics curves 43.

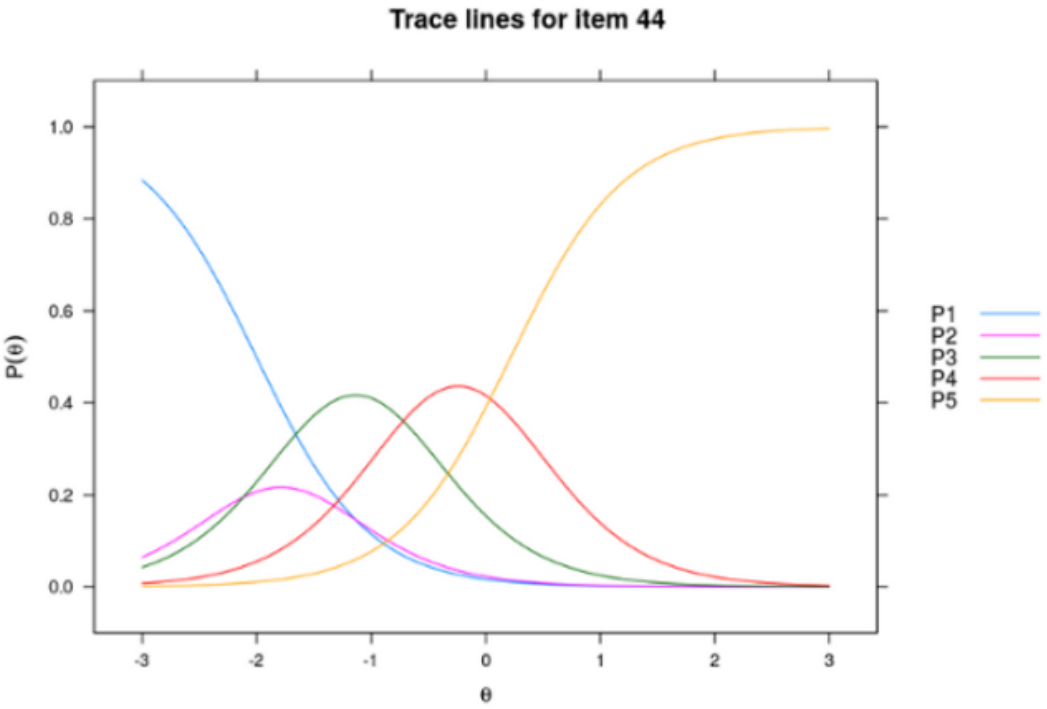

Figure C.44. Item characteristics curves 44.

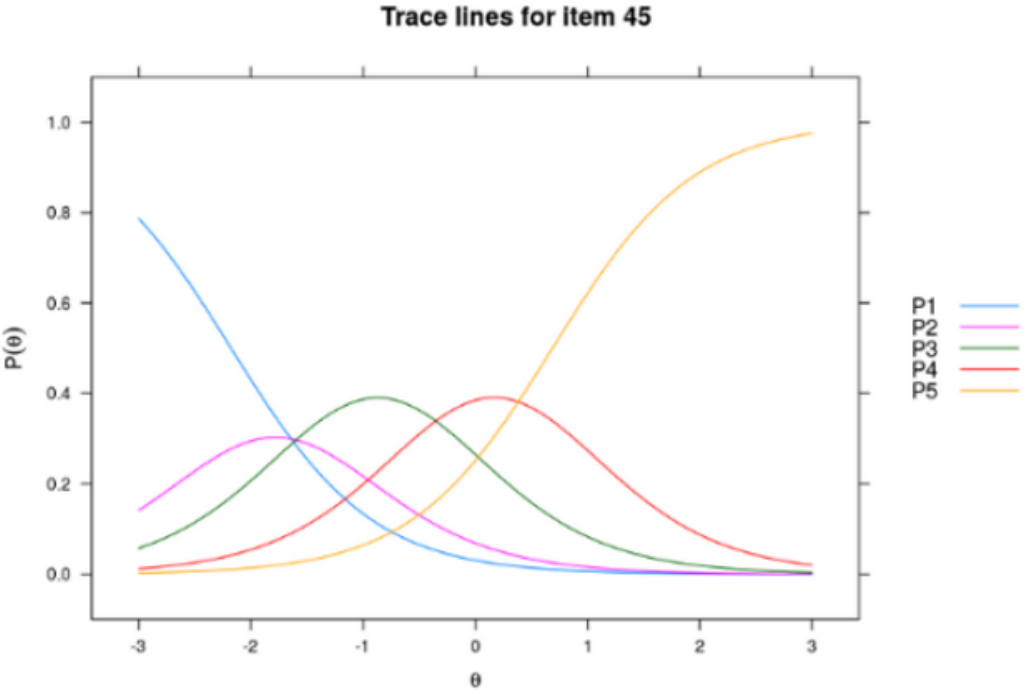

Figure C.45. Item characteristics curves 45.

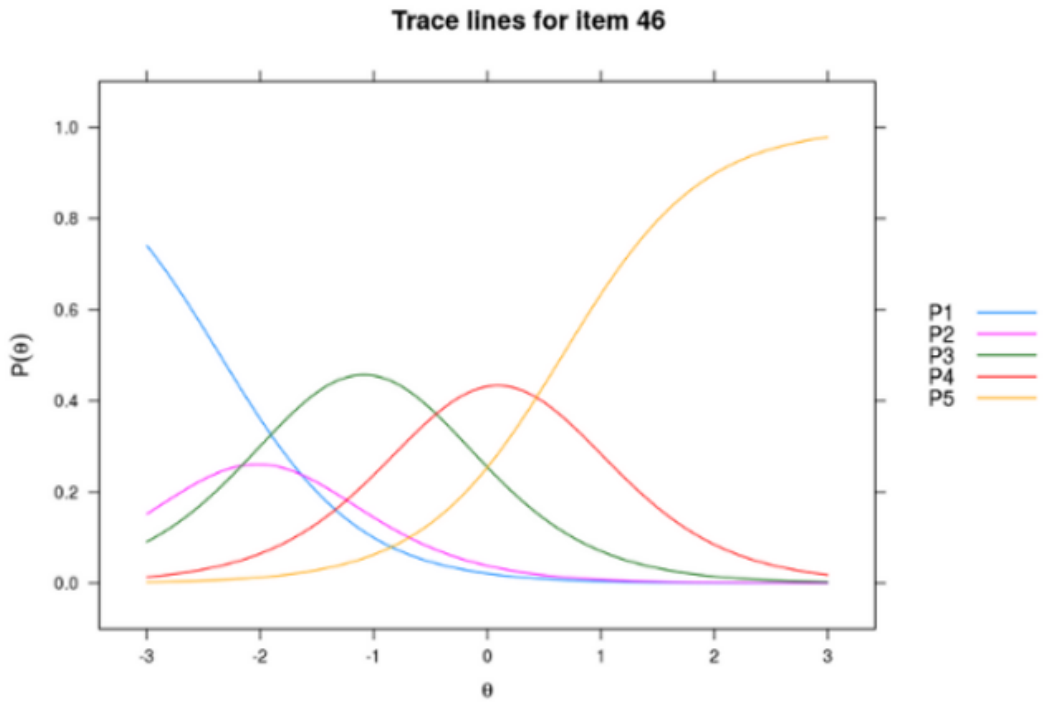

Figure C.46. Item characteristics curves 46.

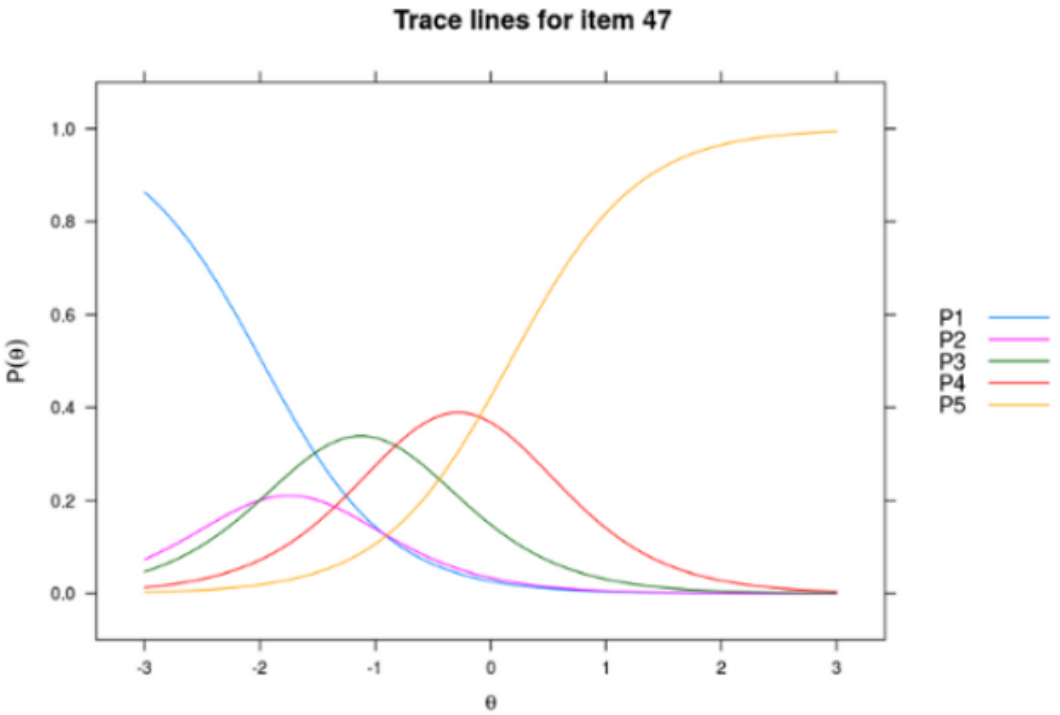

Figure C.47. Item characteristics curves 47.

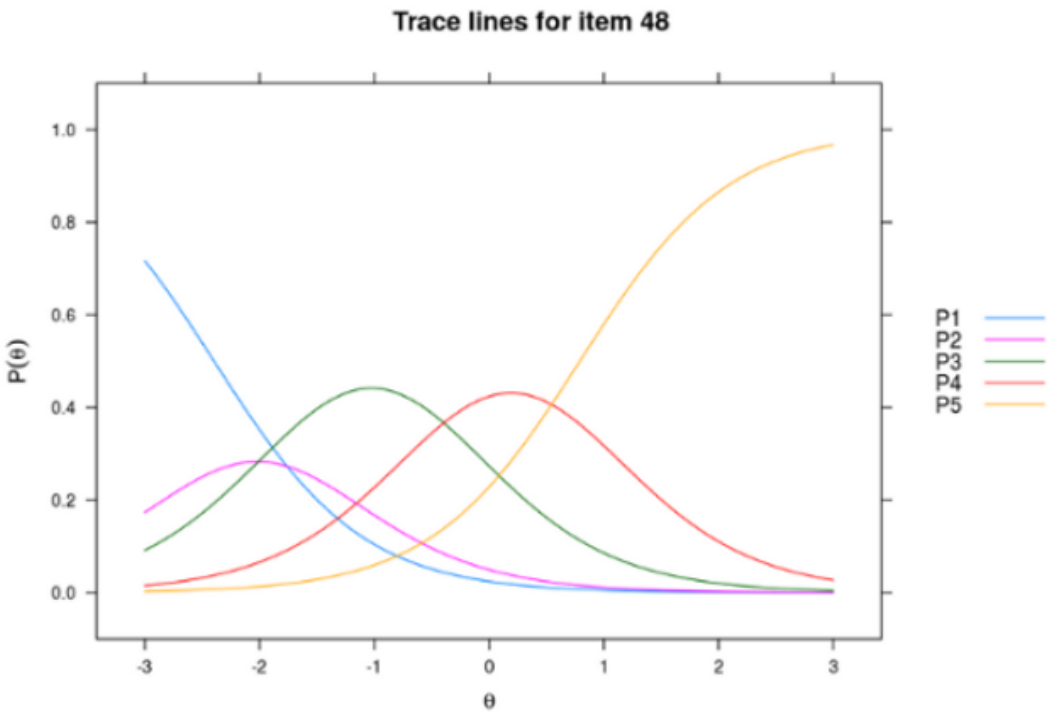

Figure C.48. Item characteristics curves 48.

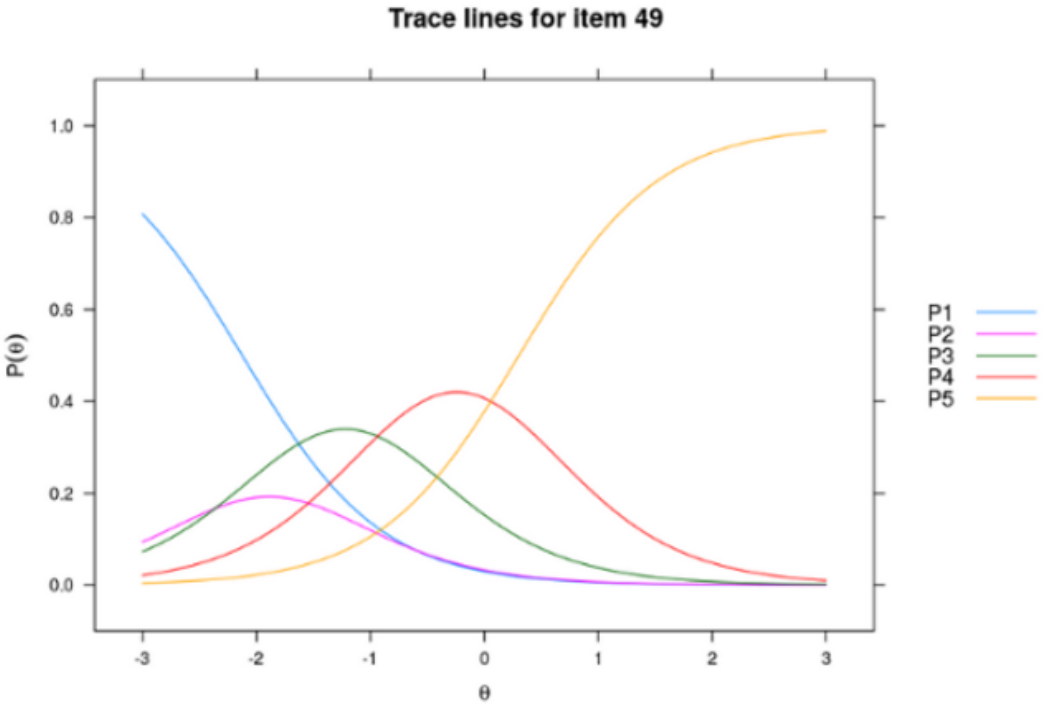

Figure C.49. Item characteristics curves 49.

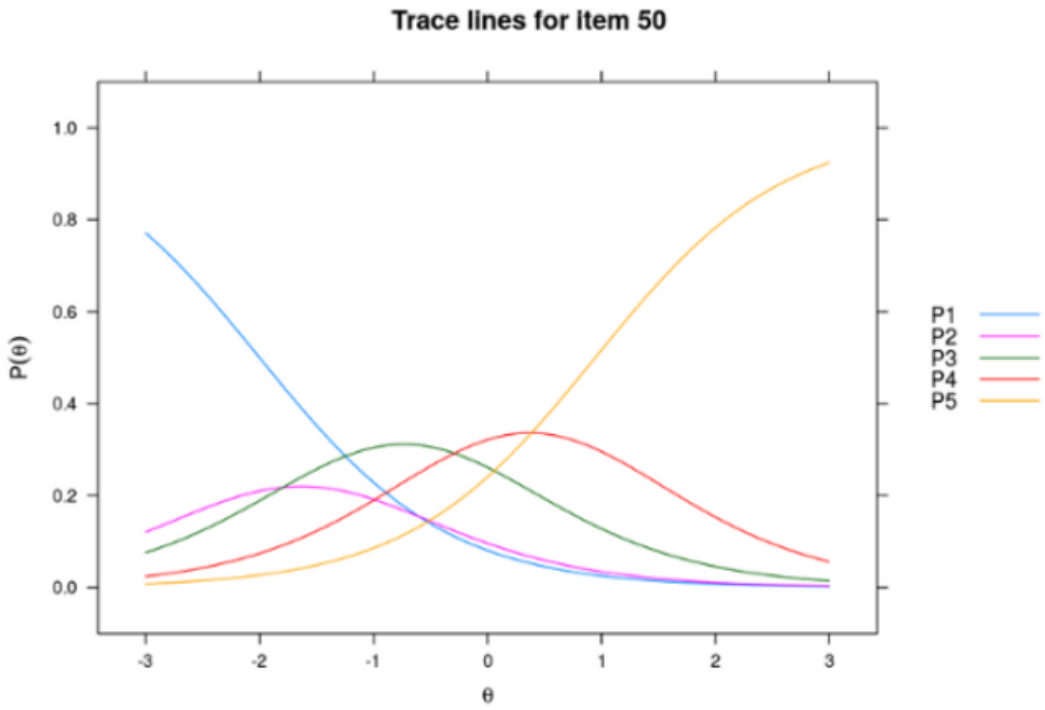

Figure C.50. Item characteristics curves 50.

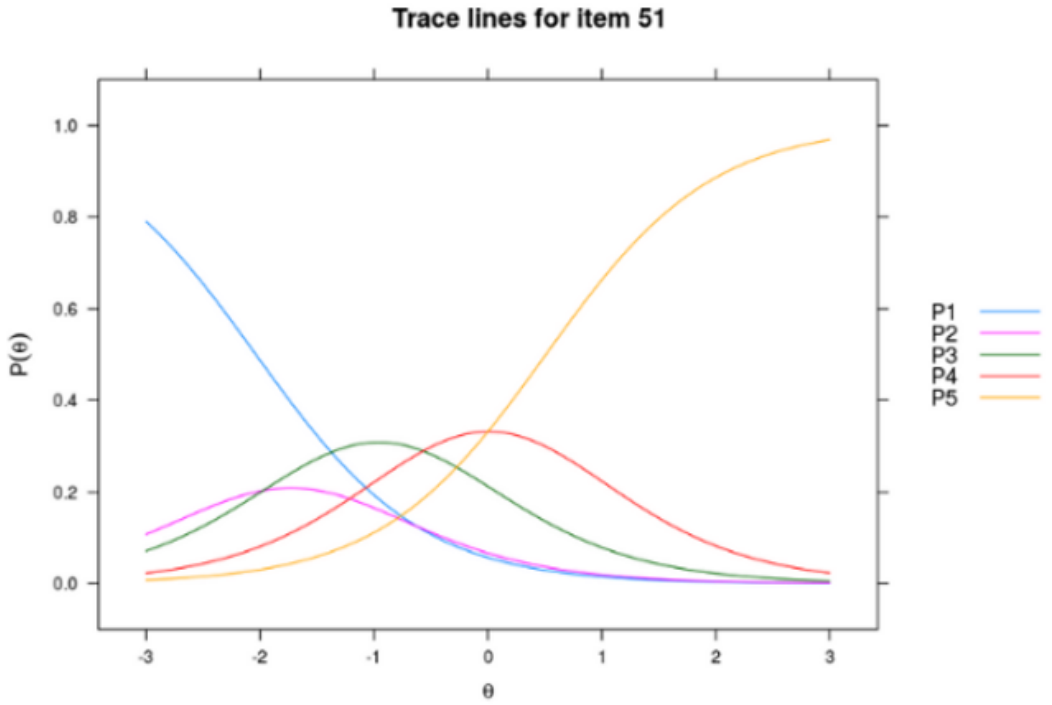

Figure C.51. Item characteristics curves 51.

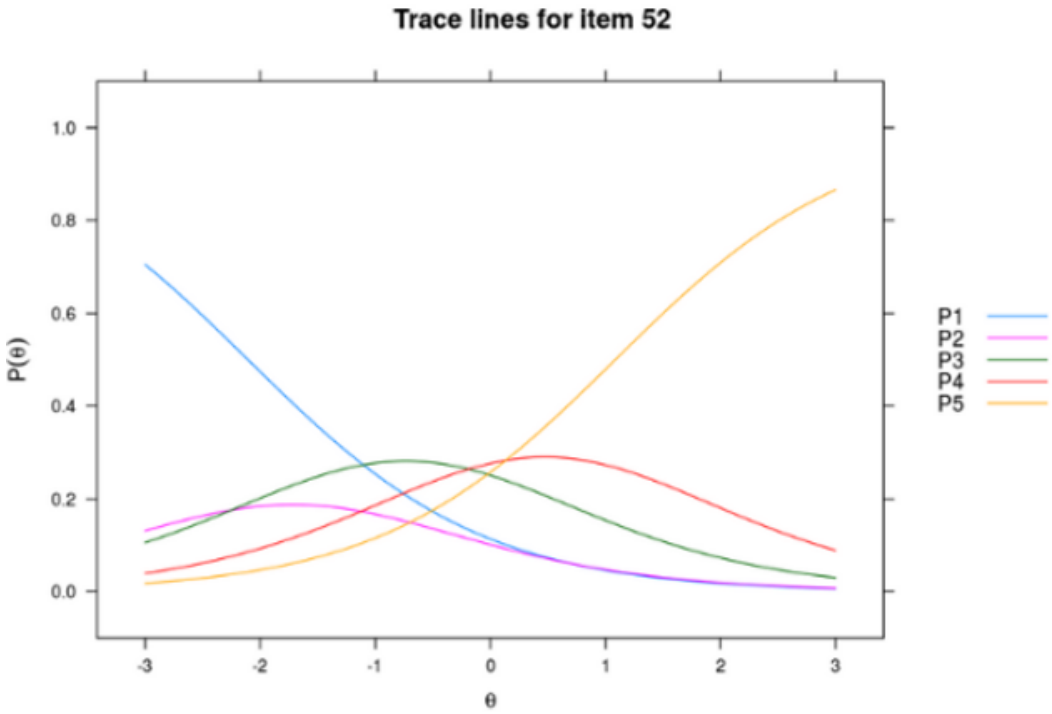

Figure C.52. Item characteristics curves 52.

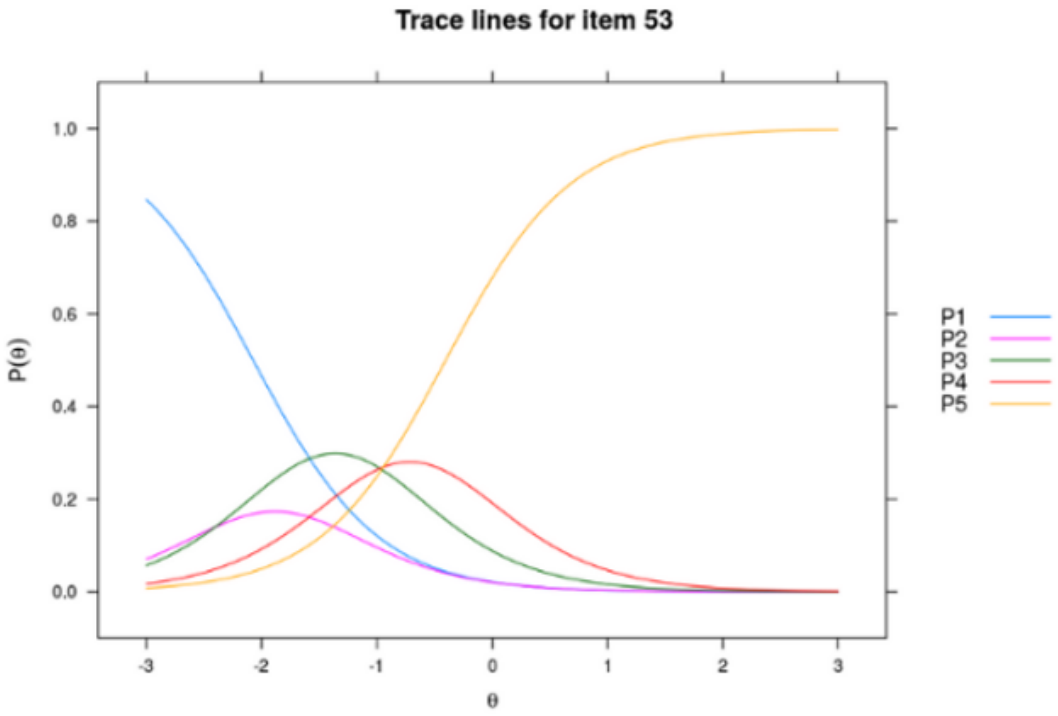

Figure C.53. Item characteristics curves 53.

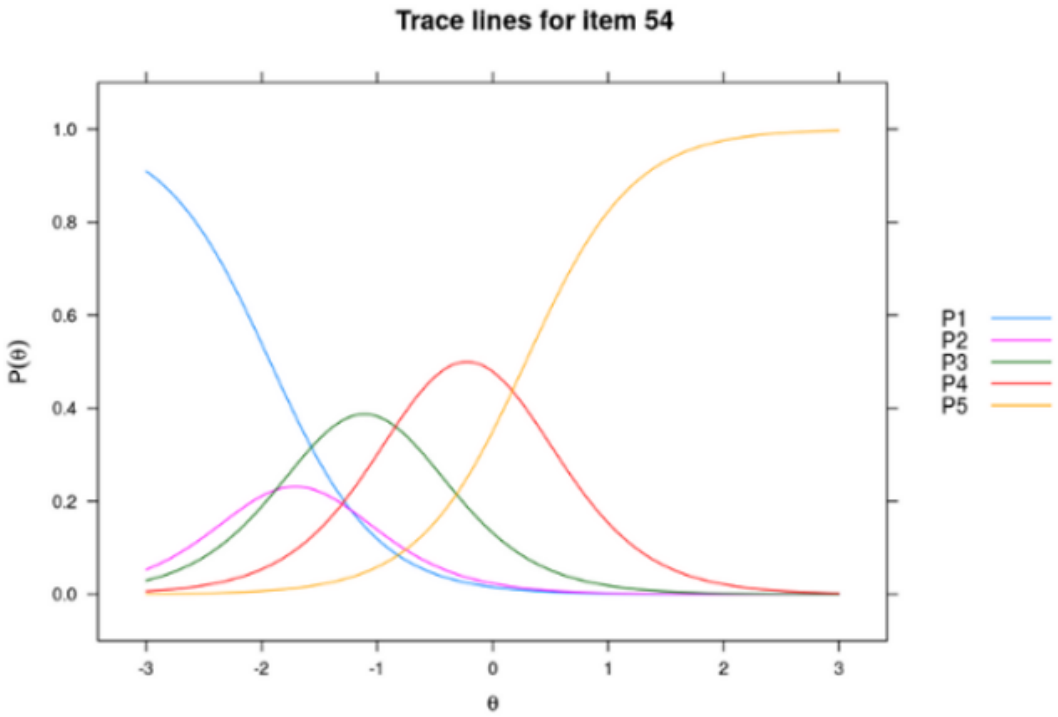

Figure C.54. Item characteristics curves 54.

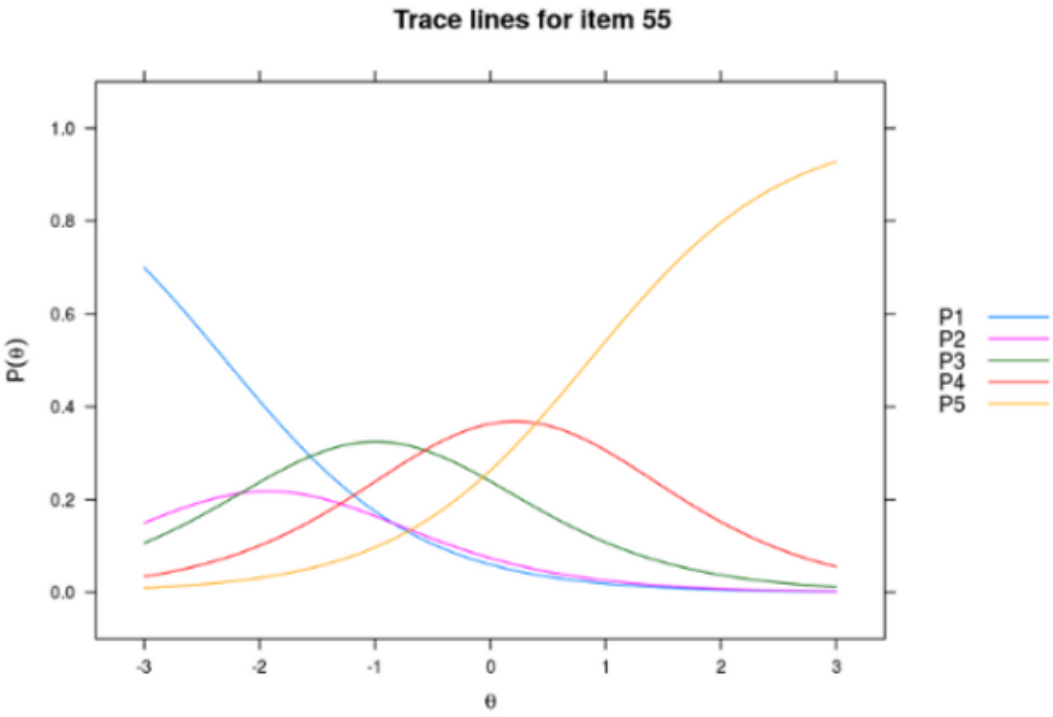

Figure C.55. Item characteristics curves 55.

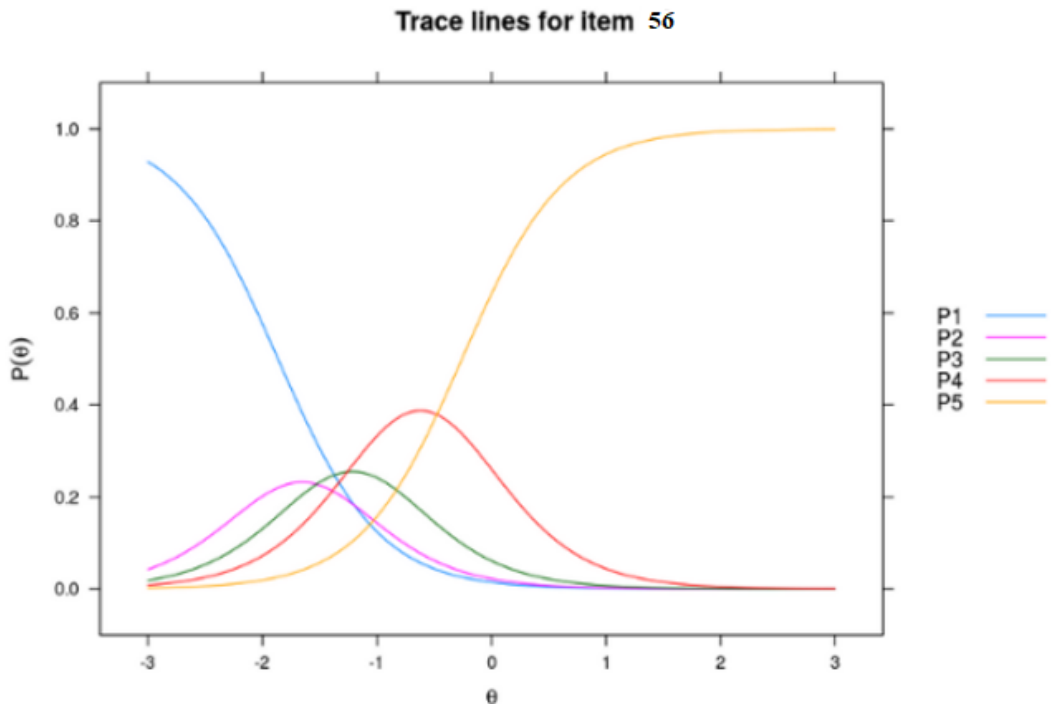

Figure C.56. Item characteristics curves 56.