

Article

Maternal Support Strategies during Daily Tasks Involving Working-Memory Demands: Educational Implications across Autism, Intellectual Disability, and Typical Development

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Abstract: This study comparatively examined mothers' observations of children aged 4–6 years with autism spectrum disorder (ASD), intellectual disability (ID), and typical development (TD) during everyday instruction-following and routine-completion tasks considered to involve working-memory demands, together with the support strategies mothers used in these situations. A basic qualitative research design was employed. Participants were 90 mothers recruited through criterion sampling in Gaziantep, Türkiye, with 30 mothers in each developmental group. Data were collected using a Personal Information Form and a seven-question semi-structured interview form and analyzed through hybrid deductive-inductive content analysis. Frequencies and percentages were used only as descriptive indicators of code prominence within the sample. Five themes were identified: remembering and completing instructions, support strategies used by mothers during tasks involving working-memory demands, mothers' forms of intervention in cases of forgetting, factors affecting independence and remembering in daily life, and difficulties experienced by mothers and their effects on social life. In mothers' accounts, task segmentation, repetition, and concretization were more prominent in the ID group; visual supports, explicit language, routines, transitions, and environmental arrangements were more prominent in the ASD group; and wait time, reminder questions, and self-monitoring support were more prominent in the TD group. These patterns were descriptive rather than diagnostic-group effects. The findings suggest that family education and early childhood educational practices may benefit from individualized scaffolding that reduces task demands while considering children's communication, attention, sensory, adaptive, and learning characteristics.

Keywords: Working Memory; Maternal Scaffolding; Autism Spectrum Disorder; Intellectual Disability; Early Childhood Education; Family Education

1. Introduction

Working memory is a dynamic cognitive process that occupies a central position in the flow of information processing, enabling information to be temporarily stored and simultaneously processed [1,2]. Baddeley [1] defines working memory as a limited-capacity system that enables information to be temporarily maintained in an active state during cognitively demanding tasks such as reasoning, reading comprehension, and learning. The most widely accepted multicomponent model of working memory in the literature was proposed by Baddeley and Hitch [3]. According to this model, working memory consists of three main components: the "central executive," which controls attention and manages the subordinate systems; the "phonological loop," which temporarily stores and processes auditory information; and the "visuospatial sketchpad," in which visuospatial information is stored

and processed [3]. In later years, a fourth component, the “episodic buffer,” was added to the model to integrate information from different memory systems and coordinate the connection between working memory and long-term memory [4].

In the present study, the term *working-memory demands* refers to characteristics of everyday tasks that require a child to temporarily maintain task-relevant information while simultaneously using, updating, sequencing, or monitoring that information during ongoing activity. Examples include remembering an instruction while moving to another location, retaining several steps of a routine while completing them in sequence, or keeping track of which steps have already been completed. Importantly, the presence of such task demands does not mean that performance on these activities constitutes a direct measure of working-memory capacity. Everyday task performance may also be influenced by language comprehension, attention, inhibitory control, processing speed, sensory characteristics, motor abilities, motivation, emotional state, familiarity with the routine, and adaptive functioning. Accordingly, the term is used in this study to characterize the cognitive demands embedded in the tasks described by mothers rather than to infer a specific working-memory impairment in an individual child.

Early childhood is a critical period for the development of working memory and other executive functions. During the preschool years, working-memory performance shows substantial age-related development and contributes to children’s ability to maintain task-relevant information, follow instructions, and coordinate sequential activities [5]. Working memory is also associated with early literacy and numeracy skills, although the strength and nature of these associations vary according to the component of working memory and the learning task involved [6]. Moreover, educational experiences themselves may contribute to changes in working-memory performance during the transition from kindergarten to formal schooling [7]. These findings highlight the importance of considering working memory as one component of a broader set of cognitive and educational processes involved in early learning. Because the cognitive and contextual demands of everyday tasks may interact with children’s developmental characteristics, it is important to consider how performance on tasks involving working-memory demands is described across different developmental profiles.

1.1. Working Memory in Children with Autism Spectrum Disorder

Research on working memory in autistic children indicates considerable heterogeneity across individuals and tasks. A recent meta-analysis nevertheless found overall differences in verbal working-memory performance between autistic and non-autistic children and adolescents, while also highlighting variability across the literature [8]. Working-memory performance in autism should not be considered independently of other developmental processes. In young autistic children, executive-function and attention abilities have been associated with language and social-communication skills, suggesting that everyday performance may reflect interactions among multiple cognitive and communicative processes rather than an isolated working-memory limitation [9]. Consistent with this perspective, Edmunds et al. [10] reported associations between verbal abilities, functional self-talk, and working-memory performance in young autistic children. Thus, language-related support may help children manage verbally demanding tasks, although such support should not be assumed to directly increase working-memory capacity.

In everyday educational contexts, reducing the amount of information children need to retain at one time and making task requirements more explicit may support task completion. Brief and familiar verbal instructions, visual supports, preparation for transitions, and environmental organization may facilitate task performance for some autistic children. However, the usefulness and intensity of such supports should be determined according to the individual child’s communication, attention, learning, sensory, and adaptive characteristics rather than assumed on the basis of diagnosis alone.

1.2. Working Memory in Children with Intellectual Disability

Research has identified differences in working-memory performance between children with intellectual disability and typically developing peers, including performance on verbal working-memory and central-executive tasks [11,12]. However, performance within the intellectual-disability population is heterogeneous and may vary according to cognitive level, language abilities, processing demands, and task characteristics. Difficulties may become particularly apparent when children are required to retain several units of information, follow multistep verbal instructions, or coordinate storage and processing simultaneously. Working-memory demands are therefore one aspect of performance and need to be considered alongside children’s linguistic, cognitive, motor, and adaptive

characteristics.

Recent evidence suggests that the performance of children with intellectual disability on tasks involving working-memory demands can vary according to how information and actions are presented. For example, Xie et al. [13] found that physically enacting instruction sequences improved recall relative to hearing the instructions alone in children with intellectual disability as well as in autistic and typically developing children, although the magnitude of the benefit differed across groups. Evidence regarding direct working-memory training is more cautious. In a double-blind randomized trial involving children with neurodevelopmental disorders and mild-to-borderline intellectual disability, Roording-Ragetlie et al. [14] observed improvements over time but did not find a superior effect of individualized active coaching compared with general coaching. Accordingly, structured instructional and environmental support may facilitate children's performance, but current evidence does not justify assuming broad or generalized improvements in working-memory capacity.

1.3. Working Memory in Typically Developing Children

Working memory develops substantially during the preschool years, although its developmental trajectory is not uniform across all components or age intervals. Recent evidence from preschool children indicates age-related increases in working-memory performance across early childhood, while individual differences remain considerable [5]. Working memory is also closely associated with emerging educational skills. In kindergarten and first grade, different components of working memory are related to early literacy and numeracy, although the strength of these associations varies according to the cognitive demands of the task [6]. Moreover, evidence comparing similarly aged children with different school-entry experiences suggests that formal schooling may contribute to improvements in working-memory performance alongside vocabulary and numeracy development [7]. These findings highlight the importance of considering working memory not only as a developing cognitive system but also as a process embedded in children's educational experiences.

1.4. Support Strategies Used by Mothers in Daily Tasks Related to Working Memory

Children's executive-function development, including working-memory performance, is associated with characteristics of the home learning environment and the quality of parent-child interactions. From an ecological perspective, these interactions occur within the child's immediate developmental context and may provide opportunities for adults to structure tasks, direct attention, and support increasingly independent participation in everyday activities [15,16]. Accordingly, maternal support during daily routines can be considered not simply as assistance with task completion but as part of the broader social and educational context in which children practise regulation, remembering, and independent action.

The nature of the support that mothers provide can also be understood through the concept of scaffolding. Wood et al. [17] described scaffolding as temporary adult assistance that enables a child to perform a task that cannot yet be completed independently, with support being adjusted and gradually reduced as the child becomes more competent. Contemporary research continues to support the relevance of this framework for executive-function development. A systematic review by Koşkulu-Sancar et al. [18] showed that positive, emotionally supportive, and cognitively stimulating parental behaviors are generally associated with stronger executive-function performance, whereas intrusive and negatively controlling behaviors tend to be associated with poorer outcomes. Research focusing more specifically on autonomy support also suggests that the form and quality of assistance may be more important than the amount of assistance alone. Castelo et al. [19], for example, found that providing children with meaningful choices during challenging activities was associated with preschool children's executive-function performance. Longitudinal evidence further indicates that associations between parenting behaviors and children's executive functions are transactional and may change across development; early autonomy support and supportive parental presence have been associated with subsequent working-memory and inhibitory-control performance [20]. These studies indicate that the way support is provided may be as important as how often it is provided. Support that is adjusted to the child's current performance and reduced as independence increases may be particularly relevant in everyday routines.

The "phonological loop" component of working memory has a reciprocal and dynamic relationship with language skills. Rich linguistic interactions between mothers and their children constitute one of the fundamental strategies for supporting working memory. Research on parent-based language interventions suggests that struc-

tured linguistic interactions in daily life may support children's language comprehension and memory-related outcomes [21]. Working memory is also associated with early literacy skills during the preschool years. In particular, significant positive associations have been reported between working-memory performance and phonological awareness [22]. More broadly, interventions involving repeated and progressively challenging activities may support the development of executive functions in childhood [23]. In addition to linguistic support, the amount of information mothers present to children in daily life and the manner in which this information is organized also determine the cognitive load placed on working memory.

Environmental and presentational adaptations may help reduce the demands placed on children during complex daily tasks. Recommended approaches include reducing the amount of information presented at one time, breaking multistep instructions into smaller units, and providing external supports that make task requirements easier to follow [24]. Such strategies are intended primarily to reduce the processing and storage demands of the task rather than to directly increase working-memory capacity. Intervention studies involving children with intellectual disability also suggest that structured support may facilitate performance, although the effects should not be attributed to any single strategy in isolation [25].

In addition to modifying task presentation, mothers may also support children in developing strategies for retaining and monitoring task-relevant information. Mothers may encourage children to use their own strategies to retain information [24]. Rehearsal, imagery, and semantic association are among the strategies that may influence performance on working-memory tasks. Experimental research has shown that instructed rehearsal can improve performance on working-memory span tasks; however, such findings should not be interpreted as evidence of generalized improvements in working-memory capacity or academic skills in preschool children [26]. In this context, comparing the working memory support strategies used by mothers of children with ASD, intellectual disability, and typical development is important for identifying similarities and differences among the groups.

Existing research has largely examined different aspects of working memory and parental support within separate developmental groups. Studies involving typically developing children have primarily focused on associations between parenting practices and executive functions, research involving children with ASD has more often examined language processes and self-talk in relation to working memory, and studies involving children with intellectual disability have frequently focused on structured working-memory interventions. Consequently, comparatively little is known about how mothers of children with different developmental profiles describe and respond to everyday tasks that place demands on remembering instructions, maintaining task steps, and completing routines.

This study compares mothers of children with ASD, intellectual disability, and typical development within the same qualitative framework. Rather than treating mothers' reports as direct measures of children's working-memory capacity, the study focuses on naturally occurring daily tasks that mothers perceive as requiring children to retain and use information while completing an activity. This comparative perspective makes it possible to identify both shared forms of maternal scaffolding and support patterns that appear more prominently within particular groups. Practically, the findings may inform family education and early childhood educational practices by clarifying how strategies such as task segmentation, visual support, explicit language, reminder questions, environmental arrangement, and wait time can be adjusted according to children's individual communication, learning, attention, and adaptive functioning characteristics.

Accordingly, the aim of this study was to comparatively examine the observations of mothers of children aged 4–6 years with autism spectrum disorder, intellectual disability, and typical development regarding daily instruction-following and routine-completion tasks considered to involve working-memory demands, as well as the support strategies they used during these tasks.

In line with this aim, the study sought to answer the following research questions:

1. According to the mothers' views, in what ways do children in the three developmental groups carry out single-step and multistep instructions?
2. What strategies do mothers use to support their children's performance in daily tasks involving working memory demands?
3. What forms of intervention do mothers use when their child forgets an instruction?
4. According to the mothers' views, what are their children's levels of independence in daily routines, and what are the perceived causes of their difficulties with remembering?

5. What difficulties do mothers experience during this process, and how are these difficulties reflected in their social lives?

2. Materials and Methods

A basic qualitative research design was adopted to provide a detailed account of the participants' daily-life experiences and practices in their own words. The basic qualitative research design was selected to describe the meanings mothers attributed to their children's daily instruction-following and task-completion behaviors and the forms of support they used.

For the purposes of data collection and analysis, everyday tasks were considered to involve working-memory demands when they required the child to retain task-relevant information while carrying out an action, maintain more than one task step, update information as steps were completed, or monitor the sequence and completion of a routine. This operational definition guided the development of the interview questions and the interpretation of mothers' descriptions. These behaviors were not treated as direct indicators of working-memory capacity or impairment because the study did not include a standardized working-memory assessment.

Instruction following, support strategies, interventions in cases of forgetting, daily independence, and difficulties experienced by mothers, as addressed in the research questions and interview form, constituted the initial analytical framework. However, the codes within these categories were derived from the participants' statements, and views that had not been anticipated in advance were allowed to be evaluated under newly developed codes.

2.1. Participants

The study group consisted of mothers of children whose chronological ages ranged from 48 to 72 months. A total of 90 mothers participated in the study, including 30 mothers of children diagnosed with autism spectrum disorder, 30 mothers of children diagnosed with intellectual disability, and 30 mothers of typically developing children. Children in the ASD and intellectual disability groups were receiving services from special education and rehabilitation centers and/or attending general education settings in public or private preschools. Typically developing children were attending public or private preschools. The children's developmental levels were not determined using a standardized assessment instrument. Instead, group formation was based on the children's chronological ages of 48–72 months and diagnoses established by authorized healthcare institutions. Group membership was determined according to diagnostic status documented by authorized healthcare institutions rather than by researcher-administered diagnostic assessment. The study was not designed to re-establish diagnoses or to classify children according to symptom severity; therefore, diagnostic-group membership should be understood as a sampling criterion rather than as a standardized characterization of the children's developmental profiles.

The participants were selected through criterion sampling, one of the purposive sampling methods. Because the study was designed to descriptively compare maternal accounts across three developmental groups, a balanced target of 30 mothers per group was established before data collection. This target was not derived from a statistical power calculation, as the primary aim was qualitative description rather than hypothesis testing or estimation of population parameters. Instead, equal group sizes were used to provide comparable breadth of maternal experiences across the ASD, intellectual disability, and typical-development groups and to avoid allowing one group to dominate the qualitative dataset. Data saturation was considered throughout the data collection and analysis process by monitoring whether later interviews continued to generate new codes or meaningful variation in mothers' experiences and support practices. The predetermined quota of 30 completed interviews per group was retained as the formal sampling target. During recruitment, 103 mothers were contacted; 10 declined to participate, and three interviews were excluded because they could not be completed, resulting in a final sample of 90 mothers.

The common inclusion criteria for all groups were that the mother voluntarily agreed to participate in the study, had sufficient proficiency in Turkish to understand the interview questions, lived in the same household as the child, and played an active role in the child's daily care. In addition, the criterion that the child's chronological age be between 48 and 72 months was applied to all groups.

The ASD group included mothers of children who had been diagnosed with ASD by an authorized healthcare institution and who did not have a diagnosis of intellectual disability. The intellectual disability group included mothers of children who had been diagnosed with intellectual disability by an authorized healthcare institution and

who did not have a diagnosis of ASD. The typical development group included mothers of children who did not have any developmental, neurological, or psychiatric diagnosis. Typical-development status was based on the absence of a reported developmental, neurological, or psychiatric diagnosis; no standardized developmental screening was administered by the research team.

The presence of more than one neurodevelopmental diagnosis in the child, the mother's lack of an active role in the child's daily care, and failure to complete the interview were regarded as exclusion criteria. Diagnostic information provided by authorized healthcare institutions was used to determine the diagnostic groups. However, the severity of disability in the intellectual disability group and the level of support needs and verbal communication skills of the children in the ASD group were not determined using standardized assessment instruments. Therefore, it was acknowledged that both diagnostic groups could be internally heterogeneous in terms of developmental characteristics. Consequently, children within the same diagnostic group may have differed substantially in cognitive functioning, receptive and expressive language, adaptive behavior, support needs, and everyday independence. Because these characteristics were not standardized or used as matching variables, the findings should not be interpreted as representing a uniform ASD or intellectual-disability profile. Because the focus of the study was not to measure the children's cognitive performance but to examine the difficulties observed by mothers in daily life and the support strategies they used, the groups were formed according to diagnostic status.

Although the mothers constituted the participants of the study, basic descriptive information regarding their children was also recorded to characterize the developmental groups represented in the sample. In the ASD group, the children had a mean age of 64.60 months (SD = 6.81, range = 48–72); 25 (83.3%) were boys and five (16.7%) were girls. In the intellectual disability group, the mean age was 63.47 months (SD = 7.02, range = 48–72); 19 (63.3%) were boys and 11 (36.7%) were girls. In the typical-development group, the mean age was 59.70 months (SD = 7.25, range = 48–72); 16 (53.3%) were boys and 14 (46.7%) were girls. These child-level characteristics are provided only to describe the composition of the maternal groups and were not used as matching variables or as independent variables in the analysis.

The characteristics of the participating mothers in terms of age, education, and employment status are presented in **Table 1**.

Table 1. Distribution of Participating Mothers by Age, Education, and Employment Status.

Variable	ID Group (n = 30)	ASD Group (n = 30)	TD Group (n = 30)
Maternal age, M ± SD	32.07 ± 2.03	31.80 ± 2.12	31.93 ± 2.07
Maternal education level, n (%)			
Primary school	0 (0.0)	0 (0.0)	2 (6.7)
Middle school	1 (3.3)	0 (0.0)	0 (0.0)
High school	20 (66.7)	21 (70.0)	17 (56.7)
Associate degree	2 (6.7)	0 (0.0)	0 (0.0)
Bachelor's degree	4 (13.3)	5 (16.7)	4 (13.3)
Graduate degree	3 (10.0)	4 (13.3)	7 (23.3)
Employment status, n (%)			
Employed	8 (26.7)	8 (26.7)	12 (40.0)
Not employed	22 (73.3)	22 (73.3)	18 (60.0)

Note: ID = intellectual disability; ASD = autism spectrum disorder; TD = typical development; M = mean; SD = standard deviation.

The mean ages of the mothers in the three groups were similar, and high school graduates constituted the majority of mothers in each group. However, the proportions of mothers who were employed and had graduate-level education were higher in the typical-development group than in the other two groups. The groups were not matched on children's chronological age or sex, and standardized information on children's language abilities, adaptive functioning, cognitive level, ASD support needs, or intellectual-disability severity was not available. Therefore, the patterns identified across the groups were not interpreted solely as direct consequences of diagnostic status; rather, they were considered descriptive patterns emerging from the mothers' accounts within this sample.

Participants were recruited through special education and rehabilitation centers and public and private preschool education institutions located in the Şehitkamil and Şahinbey districts of Gaziantep Province. Because recruitment occurred through educational and rehabilitation services, the sample may underrepresent families whose children were not enrolled in institutional services during the study period.

2.2. Data Collection Instruments

The data were collected using a “Personal Information Form” and a “Semi-Structured Interview Form.”

2.2.1. Personal Information Form

The Personal Information Form developed by the researchers consisted of questions concerning the mothers’ age, education level, and employment status, as well as the children’s chronological age, sex, and diagnostic status. The information obtained through the form was used to describe the basic characteristics of the maternal groups and the children represented within each developmental group.

2.2.2. Semi-Structured Interview Form

The Semi-Structured Interview Form was developed by the researchers to examine mothers’ observations of their children’s performance during everyday tasks considered to involve working-memory demands and the support strategies they used during these tasks. During the development of the questions, the literature on working memory [1,12,27] and the parenting and scaffolding literature [28,29] was reviewed, and a draft form was prepared. More specifically, the working-memory literature informed the selection of task situations involving information retention, sequencing, and instruction following, whereas the parenting and scaffolding literature informed questions concerning how mothers structured tasks, provided prompts, adjusted assistance, and supported children’s independent participation [28,29]. The interview form included seven main questions. During the interviews, participants were first asked open-ended main questions. Examples concerning visual, verbal, or object-based supports were used as probing questions only when a participant provided a general response or was unable to elaborate on the question.

The interview questions generally addressed children’s ability to remember instructions that required them to go to another room, their ability to follow consecutively presented multistep instructions, the visual and verbal supports used by mothers, the prompts provided in cases of forgetting, children’s level of independence in daily routines, mothers’ evaluations of their children’s difficulties with remembering, and the difficulties experienced by mothers during this process. These situations were selected because they require the temporary maintenance and use of task-relevant information during ongoing activity; however, the interview questions did not assume that unsuccessful performance was caused exclusively by working-memory limitations.

To evaluate the interview form in terms of content and comprehensibility, expert opinions were obtained from a total of five faculty members, including three faculty members with doctoral degrees in special education and two faculty members who had conducted studies on qualitative research methods. The experts were asked to evaluate each question in terms of content relevance and comprehensibility and to provide written suggestions for any revisions they considered necessary. Based on the experts’ recommendations, the wording of some questions was simplified, repetitive questions were removed, and necessary probing questions were added. To evaluate the functionality of the interview form, pilot interviews were conducted with three mothers who were not included in the study group: one mother of a child diagnosed with ASD, one mother of a child diagnosed with ID, and one mother of a TD child. Following the pilot implementation, the order, clarity, and comprehensibility of the questions and the duration of the interviews were reviewed, and the form was finalized.

2.3. Data Collection

Before the study was conducted, ethical approval was obtained from the Gaziantep University Social Sciences and Humanities Scientific Research and Publication Ethics Committee (Meeting No. 05, Decision Date: March 2, 2026, Decision No. 39, Application No. 2026-02-0087). The data collection process was initiated after ethical approval had been obtained. The institutions where the data would be collected were then contacted, and the necessary institutional permissions were secured. Mothers who met the participation criteria were informed about the purpose and scope of the study, the interview process, the purposes for which the data would be used, and their right to withdraw from the study at any time without providing a reason. Written informed consent was obtained from the mothers who agreed to participate in the study.

The interviews were conducted between March and June 2026 in quiet and appropriate settings where participants could express themselves comfortably. The interviews lasted 18–32 min, with a mean duration of 23.89

min ($SD = 4.32$). Before the interviews began, the mothers were asked to complete the Personal Information Form. The questions included in the semi-structured interview form were then asked in sequence. When participants provided brief, ambiguous, or general responses, probing questions such as “Could you provide an example of this situation?”, “What does your child generally do in such a situation?”, and “How do you intervene?” were used. During the interviews, expressions that might direct participants’ responses toward a particular answer were avoided, and each participant was given sufficient time to describe her experiences in detail.

Seventy-two participants consented to audio recording, and these interviews were recorded using an audio-recording device. The views of the 18 participants who did not consent to audio recording were documented through detailed interview notes. These notes were expanded by the researcher immediately after each interview. Following the interviews, the audio recordings were transcribed, and the interview transcripts were compared with the recordings to verify their accuracy. Participants’ names and information concerning institutions and locations were removed from the transcripts to protect the confidentiality of personal data. Accordingly, codes were assigned for use in the findings section and quotations: mothers in the ASD group were coded as “ASD-M1...”, mothers in the intellectual disability group as “ID-M1...”, and mothers in the typical development group as “TD-M1...”. Of the interviews, 43 were conducted face-to-face and 47 were conducted online. The online interviews were conducted via the Zoom platform. The same interview form, question order, and probing questions were used in both interview formats. Although the same interview protocol was used across both formats, the use of face-to-face and online interviews may have introduced differences in the interactional context of data collection. Online interviews may provide fewer opportunities to observe nonverbal and contextual cues and may be affected by differences in privacy or internet connectivity, whereas face-to-face interviews may facilitate a different level of rapport and access to contextual information. These potential mode-related differences were not examined systematically in the present study. To reduce procedural variation, the same researcher used the same interview form, question sequence, and probing approach across both formats.

Similarly, the 18 interviews that were not audio-recorded may contain less verbatim detail than the recorded interviews. Although detailed notes were taken during these interviews and expanded immediately afterward, note-based documentation may not fully preserve features such as exact wording, pauses, emphasis, or the complete sequence of participants’ expressions. The researchers therefore treated the expanded notes as valid qualitative material while acknowledging that their level of textual detail was not equivalent to that of verbatim transcripts.

2.4. Data Analysis

The interview data were analyzed using a hybrid deductive–inductive content analysis approach. The deductive component was guided by the research questions. Accordingly, instruction following, support strategies used by mothers, mothers’ interventions in cases of forgetting, children’s independence in daily routines, and difficulties experienced by mothers constituted the initial organizing categories. These categories served as a preliminary analytical framework rather than as fixed categories into which all data had to be placed. Views that were not adequately represented within the initial framework were coded inductively, and new codes and, where necessary, new subthemes were developed from participants’ accounts. Thus, the analysis was deductive in its initial organization around the research questions and inductive in the generation and refinement of codes and subthemes from the interview data [30,31].

The analysis proceeded from meaning units to codes, subthemes, and broader themes. A meaning unit was defined as one sentence or several connected sentences conveying a single idea relevant to the research questions. Meaningful statements concerning children’s ability to remember instructions, their completion of multistep tasks, the support strategies used by mothers, maternal responses when children forgot or omitted a step, children’s independence in daily routines, and mothers’ experiences were identified and coded. Codes reflecting conceptually similar experiences or behaviors were subsequently grouped into subthemes, and related subthemes were organized under broader themes. Throughout this process, the developing codes, subthemes, and themes were considered in relation to the original interview material so that the analytical structure remained grounded in participants’ accounts.

A codebook was used to organize the coding framework and to support consistency in the application of codes across the dataset. The codebook contained the codes used during the analysis and served as a common reference during the organization of codes into subthemes and themes. New codes that emerged from participants’ accounts

were incorporated into the analytical framework when they represented content that was not sufficiently captured by the existing codes. Records concerning the development of codes, subthemes, and themes were retained as part of the study's audit trail.

The 72 audio-recorded interviews were transcribed using the Voiser application. Before transcription, identifying information was removed from the file names of the audio recordings. The automatically generated transcripts were used only as initial transcripts; the researchers subsequently listened to the recordings in their entirety and corrected inaccurate sections. Detailed notes from the 18 interviews that were not audio-recorded were expanded after the interviews and included in the dataset. The complete dataset, consisting of verified transcripts and expanded interview notes, comprised approximately 510 pages. Because the note-based interviews did not contain the same level of verbatim detail as the audio-recorded transcripts, this difference was taken into account when interpreting quotation-level and language-specific nuances.

MAXQDA 2022 was used to organize the interview material, assign and retrieve codes, and compare coded segments across participants and developmental groups. The software was used as a data-management and coding-support tool; the interpretation of the data and the development of codes, subthemes, and themes were carried out by the researchers rather than being generated automatically by the software.

The interviews from the ASD, intellectual disability, and typical-development groups were initially examined within their respective groups. This within-group analysis allowed the researchers to identify patterns within each developmental context before conducting cross-group comparisons. After the within-group analysis, the codes and themes identified across the three groups were compared to determine shared patterns as well as differences in the content of mothers' accounts, the nature of the support strategies they described, the level of assistance provided, and the ways in which children were reported to complete everyday tasks. The cross-group comparison was descriptive and qualitative and was not used to test statistically significant differences between the groups.

To increase transparency regarding the prominence of coded views within the sample, the number of participants whose accounts contained each code was summarized using frequencies and percentages. Repeated statements by the same participant within the same code were counted only once, whereas multiple coding was permitted when a participant's account reflected more than one distinct code. Therefore, totals in some tables could exceed the number of participants in a group. Frequencies and percentages were used solely as descriptive indicators of how prominently particular views appeared within each group; they were not treated as estimates of population prevalence, effect sizes, or evidence of statistically significant group differences. Numerical summaries were interpreted together with the content and context of participants' accounts rather than as independent quantitative outcomes.

2.5. Trustworthiness and Researcher Positionality

To ensure the quality of the study, various strategies were implemented in accordance with the criteria proposed by Lincoln and Guba [32].

2.5.1. Credibility

To assess coding consistency, 18 interviews, consisting of six interviews randomly selected from each developmental group, were independently coded by two experts who held doctoral degrees in special education and had experience in qualitative data analysis. The independent coders used the same codebook developed through the primary analysis rather than constructing separate coding frameworks. Inter-coder agreement was calculated by comparing the codes assigned to each meaning unit using the formula $\text{Agreement} / (\text{Agreement} + \text{Disagreement}) \times 100$ and was found to be 93% [33]. Coding disagreements were reviewed jointly, and final coding decisions were reached through discussion and consensus.

2.5.2. Transferability

The research context, participant characteristics, data collection conditions, and analysis process were described in detail. Direct quotations from participants were included in the presentation of the findings to enable readers to assess the transferability of the findings to their own contexts.

2.5.3. Dependability

An audit trail was maintained throughout the analysis process. The retained materials included the raw data, code lists, the working codebook, notes documenting the development and organization of subthemes and themes, and researcher journal entries produced during analysis. These materials documented how the analytical framework developed from the interview data and supported the traceability of coding and theme-development decisions. In addition, the analysis process was reviewed by a qualitative research expert who was not directly involved in the study.

2.5.4. Confirmability

To demonstrate that the findings were grounded in participant data rather than primarily in the researchers' interpretations, each theme was supported with direct quotations. Inferences involving researcher interpretation were explicitly identified as such within the text.

2.5.5. Researcher Positionality

Both researchers are faculty members who hold doctoral degrees in special education and conduct research on developmental disabilities in early childhood and family education. The first researcher, who conducted the interviews, had no employment relationship with the institutions from which the data were collected and had no pre-existing therapeutic or educational relationship with the participants. This was considered important to ensure that the participants' decisions regarding participation in the study were not influenced by their receipt of services from the institutions.

Although the researchers' professional expertise in special education facilitated an understanding of the educational implications of the strategies described by the mothers, it also introduced the risk of interpreting the data solely within the framework of evidence-based practices. To reduce this risk, a hybrid approach combining deductive and inductive coding was adopted during the coding process. Interpretations that could reflect the researchers' preconceptions were critically examined through mutual discussion during the analysis, and direct quotations from participants were included in the presentation of the findings.

3. Results

This study examined the views of mothers of children aged 4–6 years with ASD, intellectual disability, and typical development. The study group consisted of a total of 90 mothers, with 30 mothers in each group. Meaningful units within the participants' statements that reflected a single idea or practice were used as the units of analysis. Meaning units were identified in the transcripts of the 90 interviews, coded, and included in the analysis. The analysis resulted in five overarching themes and related subthemes. Throughout the findings, frequencies and percentages are presented only to indicate the relative prominence of codes within this sample; interpretation focuses primarily on the content and patterning of mothers' accounts.

As a result of the content analysis, five main themes were identified:

1. Remembering and completing instructions,
2. Support strategies used by mothers during tasks involving working-memory demands,
3. Mothers' forms of intervention in cases of forgetting,
4. Factors affecting independence and remembering in daily life,
5. Difficulties experienced by mothers and their effects on social life.

The themes, subthemes, and sample code structure derived from the content analysis are presented in **Table 2**.

As an illustration of the analytic process, ID-M1 stated, "First, I only tell my child to wash their hands. After they do that, I ask them to put on their slippers." This meaning unit was coded as "giving instructions one at a time." The code was grouped under the subtheme "breaking the task into smaller units or steps," which was subsequently included within the broader theme "support strategies used by mothers." This example illustrates how participant statements were progressively organized from meaning units to codes, subthemes, and broader themes.

The frequencies shown in the following tables indicate how many mothers in this sample expressed each coded

view and are provided to support the description of qualitative patterns rather than to represent population prevalence or inferential group differences. Because participants could express more than one distinct view, multiple coding was permitted and the total frequencies in some tables may exceed the group size.

Table 2. Themes, Subthemes, and Sample Code Structure.

Subtheme	Sample Codes
Theme 1. Remembering and completing instructions	
Single-step instructions	Reaching the target setting and forgetting the task; selecting the wrong object; delayed remembering
Multistep instructions	Omitting an intermediate step; changing the sequence; leaving the task incomplete
Theme 2. Support strategies used by mothers during tasks involving working-memory demands	
Visual and written supports	Picture schedule; checklist; visual timer; video modeling
Breaking the task into steps	Giving instructions one at a time; using "first-then"
Verbal repetition and self-talk	Asking the child to repeat aloud; rhymes; rhythm
Routines and environmental arrangements	Fixed sequence; placing objects in visible locations; turning off screens
Waiting and transition support	Providing advance notice of transitions; allowing additional time
Theme 3. Mothers' forms of intervention in cases of forgetting	
Verbal prompts and reminder questions	"What was next?"; "Is anything missing?"
Visual, gestural, and object-based prompts	Showing the object; pointing to the schedule
Providing wait time	Waiting without intervening; encouraging the child to identify their own mistake
Theme 4. Factors affecting independence and remembering in daily life	
Independence in daily routines	Largely independent; dependent on step-by-step support; conditional independence
Perceived causes of remembering difficulties	Distractibility; difficulty processing verbal information; sensory load; fatigue
Theme 5. Difficulties experienced by mothers and their effects on social life	
Burden of repetition and monitoring	Repeating the same instruction; continuous supervision
Time pressure	Extended preparation time
Social misunderstanding	Comments such as "does not listen"; attributing the behavior to being spoiled
Restricted social participation	Avoiding visits; not participating in activities

3.1. Remembering and Completing Instructions

3.1.1. Completion of Single-Step Instructions

All mothers of typically developing children stated that their children generally completed single-step instructions that required them to go to another room. Difficulties observed in this group were mostly associated with temporary circumstances such as playing, screen use, talking to a sibling, fatigue, or acting hastily. The children were reported either to remember the task independently after a delay or to obtain the missing information by asking their mothers a question. TD-M1 described this situation as follows: "When I ask my child to bring a glass from the kitchen, they usually go immediately and bring the correct glass. Very rarely, when they go into the kitchen, they may think of drinking water or having a snack and become slightly delayed." TD-M22 stated that although her child occasionally experienced a brief lapse in attention, the child remembered the task independently: "Sometimes, while drinking water in the kitchen, my child forgets the glass in their hand and leaves it on the table. Then they realize what I asked for and bring it. They usually remember on their own."

In the accounts of mothers of children with intellectual disability, the completion of single-step tasks showed greater variability. Prominent behaviors included reaching the target setting but forgetting what to do, attending to another stimulus, selecting the wrong object, or completing only part of the task.

ID-M1 stated: "When I ask my child to bring a glass from the kitchen, they usually go into the kitchen, but once they get there, they may forget what they are supposed to do. Sometimes they open the refrigerator or look at something else on the table." ID-M13 stated that although her child completed the initial part of the task, the child had difficulty recognizing the criterion for task completion: "After picking up the glass, my child leaves it on the counter and comes back. They may think that the task has been completed."

In the ASD group, performance on single-step instructions varied depending on the clarity of the language used, the availability of visual support, the child's current activity, routines, sensory conditions, and special interests.

ASD-M6 stated that she needed to use explicit and direct instructions rather than indirect language: “When I say, ‘Could you bring the glass?’ sometimes my child only says, ‘Yes.’ I need to say, ‘Go to the kitchen and bring the glass.’” ASD-M29 stated that the task could be forgotten because of another thought or area of interest: “Sometimes my child forgets the task because they are reenacting a scene from a cartoon. When I say their name and provide a brief reminder, they return to the task.”

3.1.2. Completion of Multistep Instructions

The distribution of children’s performance in completing multistep instructions is presented in **Table 3**.

Table 3. Completion of Multistep Instructions.

Performance Pattern	ID, f (%)	ASD, f (%)	TD, f (%)
Completing all steps in the order presented	14 (46.7)	16 (53.3)	16 (53.3)
Completing most of the task but changing the order or omitting at least one step	12 (40.0)	10 (33.3)	14 (46.7)
Not initiating, leaving incomplete, or refusing the task	4 (13.3)	4 (13.3)	0 (0.0)

Note: ID = intellectual disability; ASD = autism spectrum disorder; TD = typical development.

Twelve mothers (40.0%) in the intellectual disability group stated that their children omitted one or more steps or confused the sequence of steps when completing multistep instructions. The most frequently reported pattern involved forgetting the middle or final instruction. ID-M1 stated: “My child washes their hands but may come to the table without putting on their slippers. They especially omit the instruction in the middle.” Similarly, ID-M2 stated: “My child usually does the first and the last thing I say but forgets the one in the middle.”

Some children completed all components of the task but did not follow the sequence given by the mother. ID-M3 explained this situation as follows: “My child may come to the table first and then go to wash their hands. They generally do not completely omit any of the steps, but they complete them in a different order.”

In the ASD group, 16 mothers (53.3%) stated that their children could complete multistep instructions when visual support, explicit language, a previously established sequence, or appropriate environmental conditions were provided. However, 10 mothers (33.3%) stated that their children omitted one step or left the task incomplete. ASD-M30 stated: “On some days, my child completes the three instructions in sequence, whereas on other days, they complete only one of them.” ASD-M21 indicated that familiarity with the verbal expressions used affected performance: “When the words used in the instructions are familiar, my child can complete them in sequence. When I use a different expression, they omit that step.”

All children in the typical development group were reported to complete the main steps of multistep instructions. Sixteen children (53.3%) generally completed the tasks in the order presented, whereas 14 children (46.7%) occasionally changed the sequence or omitted a minor detail. However, no child in this group was reported to abandon or completely fail to complete the task. TD-M1 stated: “My child generally follows the three instructions in the order in which they are given. They wash their hands, put on their slippers, and come to the table.” TD-M8 stated: “Because my child moves very quickly, they may make small mistakes, such as not using enough soap or putting their slippers on the wrong feet. They do not completely omit any step.”

These findings indicate that the errors observed in the typical development group were largely limited to acting hastily and omitting minor details. The mothers’ accounts in this sample suggest that difficulties retaining and sequencing task steps were more frequently emphasized in the intellectual disability group, whereas the manner in which instructions were presented and environmental conditions were more frequently emphasized in the ASD group. These patterns represent descriptive tendencies within the present sample and should not be interpreted as diagnostic-group effects or as characteristics shared by all children within each group.

3.2. Support Strategies Used by Mothers during Tasks Involving Working-Memory Demands

The frequency and percentage distributions of the strategies used by mothers are presented in **Table 4**. Multiple coding was applied because a mother could report using more than one strategy.

Table 4. Support Strategies Used in Tasks Involving Working Memory Demands.

Strategy	ID, f (%)	ASD, f (%)	TD, f (%)
Using visual or written supports	18 (60.0)	28 (93.3)	7 (23.3)
Breaking the task into smaller units or steps	11 (36.7)	13 (43.3)	3 (10.0)
Verbal repetition, self-talk, rhythm, or rhymes	7 (23.3)	7 (23.3)	6 (20.0)
Establishing routines and making environmental arrangements	11 (36.7)	13 (43.3)	6 (20.0)
Providing waiting, timing, and transition support	4 (13.3)	6 (20.0)	2 (6.7)

Note: ID = intellectual disability; ASD = autism spectrum disorder; TD = typical development.

3.2.1. Use of Visual and Written Supports

Visual or written supports were described most prominently by mothers in the ASD group, followed by mothers in the intellectual disability group, whereas they were mentioned less often in the typical-development group. Mothers described using pictures, cards, schedules, photographs, written lists, symbols, video modeling, and visual timers to make task steps more accessible.

ID-M2 stated: "Pictures showing making the bed, washing the face, getting dressed, and having breakfast are displayed on the wall in sequence. We place a mark next to the picture of the task that has been completed."

ASD-M1 stated: "I display pictures of washing hands, putting on slippers, and coming to the table on the wall in sequence. When my child sees the pictures, they act more independently than when I provide verbal instructions."

In the typical development group, visual supports were used for situations involving schoolbag preparation or multiple tasks rather than for familiar daily activities. TD-M2 stated: "When preparing the schoolbag, my child looks at a simple picture checklist that I prepared."

3.2.2. Breaking Tasks into Smaller Units

Breaking tasks into smaller units was described more often by mothers in the ASD and intellectual disability groups than by mothers in the typical-development group.

ID-M1 stated: "First, I only tell my child to wash their hands. After they do that, I ask them to put on their slippers."

ASD-M24 stated: "First, we provide a quiet rest period. Then I present the instructions one at a time with visual support."

In the typical development group, tasks were divided into smaller units only when they were more complex or when the child was tired. TD-M1 stated: "For more complex tasks, I divide them into parts by saying, 'First you will do this, and then you will do that.'"

3.2.3. Verbal Repetition and Self-Talk

The use of verbal repetition, self-talk, rhymes, and rhythm was reported at similar rates across the three groups. However, the manner in which the strategy was used differed across groups.

In the intellectual disability group, the strategy was generally initiated following a reminder from the mother or teacher. ID-M11 stated: "We also use at home the aloud repetition method that we learned together with the teacher. My child can use this method when I provide a reminder."

ASD-M30 stated: "On some days, I ask my child to repeat the task steps aloud using brief words. This method is particularly effective when they begin to forget the verbal instruction."

Children in the typical development group were reported to use behaviors such as counting on their fingers, listing the names of objects, or checking themselves more independently.

3.2.4. Routines and Environmental Arrangements

Routines and environmental arrangements were described more prominently in the ASD and intellectual disability groups than in the typical-development group.

ID-M12 stated: "I place my child's clothes on the bed in sequence. This makes it easier for them to see what they need to do."

ASD-M2 stated: "We always carry out daily routines in the same order. When the sequence on the schedule is going to change, I show my child the new sequence in advance."

In the typical development group, environmental arrangements were mainly reported in the form of turning off the screen, directing the child's attention toward the mother, and reminding the child of important tasks in advance.

3.3. Mothers' Forms of Intervention in Cases of Forgetting

The main forms of intervention used by mothers when their child forgot an instruction are presented in **Table 5**.

Table 5. Forms of Intervention Used in Cases of Forgetting.

Form of Intervention	ID, f (%)	ASD, f (%)	TD, f (%)
Providing a reminder question or verbal prompt	28 (93.3)	28 (93.3)	30 (100.0)
Providing a visual, gestural, or object-based prompt	16 (53.3)	15 (50.0)	7 (23.3)
Allowing the child time to think and remember independently	10 (33.3)	12 (40.0)	18 (60.0)

Note: ID = intellectual disability; ASD = autism spectrum disorder; TD = typical development.

The majority of mothers in all three groups attempted to help the child remember independently by asking questions such as "What were you supposed to do?", "What was next?", or "Is anything missing?" rather than directly providing the answer. ID-M1 stated: "I ask, 'What did I ask you to do?' or 'Where had you gone?' If my child cannot remember, I provide a prompt, such as showing the glass." ASD-M13 stated: "I ask which box on the list is empty. My child looks and finds it independently." TD-M8 stated: "I say, 'Can you check?' My child usually finds the mistake independently."

Visual, gestural, or object-based prompts were described more often in the ASD and intellectual disability groups than in the typical-development group. This finding suggests that mothers in the typical development group generally considered a single verbal reminder sufficient, whereas mothers in the ASD and intellectual disability groups reported a need to supplement verbal prompts with visual or gestural supports.

Providing wait time for the child to remember independently was reported more frequently in the typical development group. Allowing the child time to think and remember independently was described most prominently by mothers in the typical-development group. In these accounts, mothers emphasized waiting before intervening so that the child had an opportunity to identify the omitted step or retrieve the instruction independently.

3.4. Factors Affecting Independence and Remembering in Daily Life

3.4.1. Independence in Daily Routines

The children's levels of independence in daily routines such as putting on shoes, getting their coats, and preparing their bags are presented in **Table 6**.

Table 6. Levels of Independence in Daily Routines.

Level of Independence	ID, f (%)	ASD, f (%)	TD, f (%)
Largely independent	3 (10.0)	5 (16.7)	20 (66.7)
Partially independent, requiring occasional support	21 (70.0)	17 (56.7)	10 (33.3)
Requiring intensive or regular guidance	6 (20.0)	8 (26.7)	0 (0.0)

Note: ID = intellectual disability; ASD = autism spectrum disorder; TD = typical development.

Mothers in the typical-development group generally described their children as largely independent in daily preparation tasks, although some children required occasional support with matters such as clothing selection, remembering personal belongings, or time management. TD-M9 stated: "My child gets ready independently. Sometimes they may choose clothes without considering the weather."

In the intellectual disability group, partial independence was the most commonly described pattern. ID-M13 stated: "My child gets their coat but tries to go outside without fastening the zipper. They put on their shoes but do not check the laces."

In the ASD group, independence was found to depend on the child's access to visual support, the consistency of the routine, the sensory characteristics of the environment, and whether the task had been explained in advance.

ASD-M9 stated: “When there is a going-out schedule, my child can get their shoes and coat. When the schedule is not available, they wait by the door.” ASD-M30 stated: “My child completes some steps independently. They do not need the same amount of support every day.”

Mothers’ accounts in this sample suggested that independence in the intellectual disability group was more closely associated with support for individual task steps, whereas independence in the ASD group depended more on environmental conditions and the appropriateness of the support provided.

3.4.2. Mothers’ Views on the Causes of Remembering Difficulties

The mothers’ views regarding the reasons why their children experienced difficulties with remembering are presented in **Table 7**. Multiple coding was applied because a mother could report more than one perceived cause.

Table 7. Perceived Causes of Remembering Difficulties.

Perceived Cause	ID, f (%)	ASD, f (%)	TD, f (%)
Divided attention or a shift away from the task focus	10 (33.3)	15 (50.0)	20 (66.7)
Difficulty understanding, processing, or retaining verbal information	11 (36.7)	11 (36.7)	3 (10.0)
Difficulties related to routines, context, generalization, sensory characteristics, or transitions	8 (26.7)	13 (43.3)	4 (13.3)
Motivation, anxiety, emotional state, or fatigue	8 (26.7)	8 (26.7)	16 (53.3)
Task initiation, planning, decision-making, or slow processing	10 (33.3)	6 (20.0)	8 (26.7)

Note: ID = intellectual disability; ASD = autism spectrum disorder; TD = typical development.

In the typical-development group, mothers most often linked difficulties with remembering to attention being redirected toward play, screen use, siblings, or other ongoing activities. Fatigue, unwillingness, motivation, and emotional state were also recurring explanations. TD-M8 stated: “I think my child’s forgetting is caused by acting hastily.” TD-M12 stated: “When my child becomes highly focused on an activity that interests them, they miss the conversations taking place around them.”

In the intellectual disability group, difficulty retaining or processing verbal information was a prominent explanation in mothers’ accounts. ID-M2 stated: “The amount of time my child can retain what is said may be short. They understand better when I use brief and explicit sentences.” ID-M16 stated: “I think the main problem is not forgetting but needing time to process what has been said.”

In the ASD group, mothers frequently described remembering performance as being shaped by the interaction of attention, routines, sensory characteristics, context, and transitions. ASD-M30 stated: “Language comprehension, attention, sensory load, anxiety, transition difficulties, and motivation can all have an effect together.”

3.5. Difficulties Experienced by Mothers and Their Effects on Social Life

The distribution of the difficulties experienced by mothers is presented in **Table 8**.

Table 8. Difficulties Experienced by Mothers.

Difficulty Experienced	ID, f (%)	ASD, f (%)	TD, f (%)
Burden of continuous repetition, guidance, or monitoring	19 (63.3)	17 (56.7)	11 (36.7)
Time pressure and extended preparation time	13 (43.3)	12 (40.0)	15 (50.0)
Misinterpretation of the child’s behaviors by others	18 (60.0)	20 (66.7)	0 (0.0)
Burden of arranging the environment and informing others	13 (43.3)	14 (46.7)	3 (10.0)
Restriction of social activities or visits	4 (13.3)	5 (16.7)	0 (0.0)
Difficulty distinguishing the cause of the child’s behavior	6 (20.0)	4 (13.3)	2 (6.7)

Note: ID = intellectual disability; ASD = autism spectrum disorder; TD = typical development; f = frequency; % = percentage. Because mothers could report more than one difficulty, multiple coding was applied, and the sum of the frequencies could exceed the group size.

3.5.1. Burden of Continuous Guidance and Monitoring

The burden of repeated guidance and monitoring was described particularly prominently by mothers in the intellectual disability and ASD groups.

ID-M1 stated: “What tires me most is having to say the same thing over and over again.” ID-M13 stated: “Having to constantly check after my child is difficult for me.”

ASD-M30 stated that the presence of different underlying reasons for the child's behavior made it difficult to plan appropriate support: "Sometimes my child genuinely forgets, sometimes they do not understand, sometimes they experience sensory difficulties, and sometimes they do not want to make the transition."

Although the burden of repetition and guidance was lower in the typical development group, 11 mothers stated that they had to repeat the same instruction several times, particularly when the child was using a screen, playing, or acting hastily.

3.5.2. Time Pressure

Time pressure was described across all three groups, although the sources and meanings of this pressure differed. In the typical development group, lingering, joking, refusing to stop screen use, or waiting until the last minute were prominent. In the ASD and intellectual disability groups, mothers emphasized the need to allow the child time to think, wait for the child to follow the visual support, and remind the child of the task steps again.

ID-M7 stated: "When we need to arrive somewhere on time, I feel caught between giving my child time to think and helping them quickly."

In the ASD group, ASD-M22 stated: "When we need to arrive somewhere on time, it is difficult to wait long enough."

3.5.3. Social Misunderstanding

Social misunderstanding emerged primarily in the ASD and intellectual disability groups and was not identified as a theme in the typical-development group.

ID-M3 stated: "Sometimes people outside think that my child is deliberately acting slowly." ID-M17 stated: "People around us may interpret this as being spoiled."

ASD-M21 stated: "When my child does not do something, they say, 'They are not listening to me.' In fact, my child may not have understood the expression that was used." ASD-M25 stated: "What challenges me most is when people say, 'Look at my face and listen to me.' I have to explain to them that my child can listen without making eye contact."

3.5.4. Restricted Social Participation

Four mothers in the intellectual disability group, and five mothers in the ASD group stated that, because of their children's needs, they avoided prolonged visits, did not participate in certain activities, or had to remain beside their children continuously in social settings.

ID-M4 stated: "Because I have to stay beside my child constantly when we visit others, I cannot have a relaxed conversation." ID-M14 stated: "This situation sometimes causes me to decide not to participate in activities."

The theme of avoiding social activities or restricting social participation did not emerge in the typical development group. Mothers stated that their children generally behaved independently and adaptively in social settings.

3.5.5. Overall Evaluation across Groups

When the findings were considered as a whole, the forms of support used by mothers in the three groups were not separated by clear-cut boundaries; however, certain patterns of support were more prominent in particular groups. In the accounts of mothers in the intellectual disability group, breaking tasks into smaller steps, making tasks concrete, and monitoring task completion were emphasized more frequently. In the ASD group, visual supports, routines, preparation for transitions, and environmental arrangements were more prominent. In the typical development group, waiting, using reminder questions, and allowing the child to check their own mistakes were emphasized more often. These patterns should not be regarded as fixed characteristics representing all children in the groups, but rather as descriptive tendencies that emerged from the accounts of mothers in this sample.

4. Discussion

This study examined how mothers of children with ASD, intellectual disability, and typical development described everyday tasks involving working-memory demands and the support they provided during these tasks. Similar behaviors were described across the groups, but mothers did not always attribute these behaviors to the

same circumstances. For this reason, the group patterns are interpreted here as descriptive differences within the present sample rather than as direct consequences of diagnostic status. The numerical summaries reported in the Results are used only to describe the prominence of coded views within this sample and are not interpreted as quantitative evidence of between-group effects. The observed patterns may also reflect unmeasured differences in language, attention, cognitive and adaptive functioning, age, sex, and support needs, and therefore cannot be attributed uniquely to diagnostic status.

4.1. Remembering and Completing Instructions

The first major finding of the study was that typically developing children completed single-step and multistep instructions more independently than children with ASD and intellectual disability. Mothers of typically developing children generally described greater independence in familiar single-step and multistep routines, although occasional sequencing errors and omissions were also reported. This pattern should be interpreted within the context of rapid developmental change in working memory and inhibitory control during the preschool years, while also recognizing that educational experience contributes to cognitive change beyond chronological maturation alone [5,7].

Minor sequencing errors and omitted details are compatible with the continuing development of executive functions during the preschool years. Because the children in the sample were between 4 and 6 years of age, their working memory, inhibitory control, and self-monitoring processes had not yet fully matured. Wolfe and Bell [34] showed that working-memory and inhibitory-control performance in early childhood varied in relation to age, temperament, language skills, and brain electrical activity. This variability is consistent with the continuing development of executive functions during the preschool years. Therefore, the minor errors observed in the typical-development group may be compatible with the continuing development of executive functions during the preschool years rather than indicating a persistent working-memory limitation.

This finding may also be explained by the organization of familiar daily routines into integrated representations in long-term memory. The literature indicates that combining related units of information into meaningful groups, or chunking, reduces the demands placed on working memory [27,35]. Therefore, an instruction such as “Wash your hands, put on your slippers, and come to the table” may no longer represent three independent units of information for these children but may instead constitute a familiar preparation routine. Thus, rather than retaining each step separately in working memory, the child may act on the basis of a previously learned routine. This may reduce working-memory demands and support more independent performance.

In the intellectual disability group, mothers more often described omissions of intermediate or final task steps, changes in sequence, and a need for additional support during multistep activities. The mothers’ reports that the middle or final instruction was particularly likely to be forgotten are compatible with tasks that place greater storage and processing demands on working memory. One possible interpretation is that, while the child is completing an earlier step, later task information becomes more difficult to maintain. Because working memory was not directly assessed, however, this explanation cannot be distinguished from language, attention, processing-speed, or task-comprehension factors in the present study.

Rezzagil and Akman [36] stated that children experiencing working memory difficulties forget the content of instructions and the sequence of challenging activities, omit certain steps of multistep activities, and have difficulty completing activities they have initiated. Doğan [2] also emphasized that working memory is a limited-capacity system and that increasing simultaneous storage and processing demands makes performance more difficult. Such errors are consistent with the demands placed on working memory when several units of information must be retained while an action is being performed; however, they cannot be attributed to working-memory capacity alone.

Van der Molen et al. [11] demonstrated that children with mild intellectual disability performed more poorly on phonological loop and central executive tasks than chronologically age-matched typically developing peers. Schuchardt et al. [12] also reported that performance in the phonological, visuospatial, and central executive components of working memory varied according to the severity of intellectual disability.

Nevertheless, not every incomplete or incorrect performance in the intellectual disability group should be explained solely by working memory. The child’s understanding of the concepts included in the instruction, ability to meet the motor demands of the task, capacity to select the appropriate object, and motivation to initiate the task may also affect performance. For example, a child who omits the step of putting on slippers may have forgotten the step or may have omitted it because of motor difficulty in putting on the slippers. Therefore, although mothers’

observations provide important information about working memory, they should not be interpreted as identifying the definitive cause of the behavior without support from direct cognitive assessments.

In the ASD group, mothers described considerable variability in children's performance on multistep instructions. Performance was generally described as more successful when instructions were brief and explicit, familiar language was used, visual support was available, and environmental demands were reduced.

Working-memory performance in autistic children is closely intertwined with language, attention, and broader executive-function demands [8–10]. Edmunds et al. [10] found that verbal abilities and the use of self-talk were associated with working memory performance in children with ASD aged 2–4 years. This association is consistent with mothers' reports that performance varied according to the clarity and familiarity of the language used; however, the present data do not allow language-related effects to be distinguished from working-memory demands.

The variability reported in the ASD group may partly reflect whether children could use an existing skill under particular task and environmental conditions. In the literature, this distinction is addressed through the difference between skill acquisition and the generalization of a skill across different settings, people, and materials. Within this framework, the inability to complete in a different context a task that can be completed in a familiar environment with a visual schedule may not indicate that the information has been entirely forgotten. Instead, it may suggest that the demands of generalization and replanning increase the load placed on working memory. A child may be able to complete a task in a familiar setting with a visual schedule but may be unable to perform the same task in a different environment or when different wording is used. When the demands of interpreting a verbal instruction, inhibiting irrelevant stimuli, disengaging from the previous activity, and constructing a new task sequence arise simultaneously, the overall load on working memory increases. Therefore, performance in the ASD group should be considered not only in terms of capacity limitations but also in relation to the linguistic and contextual conditions that affect access to working memory.

4.2. Support Strategies Used by Mothers during Tasks Involving Working-Memory Demands

External supports that reduced the amount of information children needed to retain at one time—particularly visual supports and task segmentation—were more prominent in the accounts of mothers in the ASD and intellectual disability groups. The strategy of breaking tasks into smaller units was reported by 43.3% of mothers in the ASD group, 36.7% of mothers in the intellectual disability group, and 10.0% of mothers in the typical development group. These findings indicate that external support practices aimed at reducing the cognitive load of the information presented to children were more prominent in the accounts of mothers in the ASD and intellectual disability groups. Doğan [2] states that support for children with working memory limitations can be addressed in two ways: attempting to improve working memory capacity directly and reducing the processing load that tasks place on working memory. Doğan [2] identifies reducing the amount and complexity of information presented to the child as one of the fundamental approaches for supporting the performance of children with working memory difficulties. Breaking tasks into smaller units, presenting instructions one at a time, and using visual reminders are directly consistent with this second approach.

The use of visual schedules, task cards, or pictures enables temporary verbal information to be transformed into a more permanent external representation. Whereas a verbal instruction is no longer available after it has been spoken, a picture or written list remains as a source of information that the child can consult repeatedly. Thus, the child does not have to retain all task steps simultaneously in phonological working memory. Visual supports may also reduce the monitoring and control demands placed on the central executive by enabling the child to distinguish between completed and uncompleted steps.

The more prominent use of visual supports in the accounts of mothers in the ASD group should not be interpreted as demonstrating that autistic children as a group inherently require visual support to a greater extent than other children. This pattern may reflect children's individual language, attention, transition, or contextual support needs, as well as mothers' previous exposure to structured special-education practices. Because mothers' knowledge of intervention approaches and children's individual developmental characteristics were not independently assessed, the present study cannot determine which factors accounted for the greater prominence of visual-support use in this sample.

In the intellectual disability group, breaking tasks into smaller steps, repetition, and practical demonstration were particularly prominent. This result is consistent with studies demonstrating the positive effects of structured

working memory interventions for children with intellectual disability. In the study conducted by Öran [25], children with mild intellectual disability who participated in an intervention program designed to improve working memory demonstrated significantly higher working memory performance than the control group, and improvements were also identified in their pragmatic language skills. This finding indicates that the difficulties experienced by children are not immutable and can be supported through systematic instruction.

The use of visual schedules and task segmentation should not, however, be taken as evidence of increased working-memory capacity. These strategies primarily enable children to use their existing capacity more effectively and reduce the cognitive demands of the task. Through regular implementation, children may learn certain routines and become more independent; however, improvements resulting from increased capacity and those resulting from environmental adaptations need to be distinguished through direct cognitive assessments.

The less frequent use of visual supports and task segmentation in the typical development group does not mean that these children did not require support. Mothers in this group used external supports primarily for complex tasks, school preparation, or times when the child was tired. Because typically developing children may be able to represent familiar daily routines more holistically and independently check for omitted steps, mothers may have had less need to provide continuous visual support.

4.3. Verbal Repetition and Self-Talk

Verbal repetition and self-talk were described across all three groups, but the degree to which children used these strategies independently appeared to differ. The similarity of these rates across the groups indicates that verbal repetition is not a strategy used exclusively with children with special needs. However, the degree to which the strategy was used independently differed across the groups. Whereas most children in the intellectual disability group used verbal repetition following a reminder from their mother or teacher, some children in the typical development group used behaviors such as counting on their fingers or repeating important words to themselves more independently.

Doğan [2] states that verbal information in the phonological loop is maintained in an active state through mental or aloud repetition, but that the spontaneous use of rehearsal strategies becomes more evident at approximately 7 years of age. The fact that the children in the present study were between 4 and 6 years of age may partly explain why verbal repetition was not used spontaneously by all children. During this developmental period, rehearsal strategies may therefore require modeling, prompting, or joint use with an adult for some children.

For verbal self-talk to be effective in the ASD group, the child needs not only to repeat the sentence they hear but also to use repetition to plan the steps of the task. The findings of Edmunds et al. [10] indicate that verbal abilities and functional self-talk are associated with working memory performance in children with ASD. Therefore, brief and meaningful key expressions such as “wash hands, put on slippers, come to the table” may be expected to be more functional than repeating lengthy instructions verbatim.

According to the researchers’ interpretation, the effects of rhythm and rhymes may not be explained solely by motivation. Rhythm may facilitate the grouping of information units by organizing verbal information into a regular pattern. In this way, three separate instructions may be remembered as a more integrated verbal structure. However, studies directly comparing children’s performance on tasks completed with and without rhythm are needed to confirm this inference.

4.4. Mothers’ Forms of Intervention in Cases of Forgetting

Across all three groups, mothers commonly described using reminder questions rather than immediately providing the answer. Visual, gestural, and object-based prompts were more prominent in the ASD and intellectual disability groups, whereas waiting for independent recall was emphasized more often in the typical-development group. This finding indicates that mothers attempted to reactivate the child’s existing knowledge rather than completing the task on the child’s behalf. Questions such as “What was next?”, “Is anything missing?”, and “What did you do last?” may function as retrieval cues that help the child access information in working memory or long-term memory rather than providing new information. In this way, reminder questions may give the child an opportunity to monitor their own remembering process.

The more prominent emphasis on wait time in the typical-development group may reflect mothers’ expectation that their children could often retrieve the instruction independently when given additional time. In contrast,

mothers in the ASD and intellectual disability groups may have provided visual or verbal prompts earlier because their previous experiences suggested that waiting alone might not enable the child to retrieve the task. It may reflect differences in how mothers judged the amount and timing of assistance required in particular situations.

Reminder questions and wait time may function as forms of scaffolding because mothers can adjust the amount of help they provide to the child's current performance rather than immediately replacing the child's own attempt to remember or solve the problem. This interpretation is consistent with contemporary evidence emphasizing that the quality, timing, and adjustment of parental support may be more relevant to executive-function development than the amount of support alone [18–20]. In the present study, however, the use of these strategies should not be interpreted as evidence that mothers systematically applied a formal scaffolding procedure. Rather, their accounts suggest that some mothers spontaneously adjusted the level of assistance according to their child's previous performance and the immediate demands of the task.

Nevertheless, time pressure may reduce mothers' willingness or ability to wait. When it is necessary to arrive somewhere on time, a mother may repeat the task instruction or complete the task on the child's behalf rather than waiting for the child to remember. Although this may reduce preparation time in the short term, it may limit the child's opportunities to practise independent remembering and error monitoring in the long term. Accordingly, educational and family-support practices should distinguish, as far as possible, between situations in which additional assistance is required and those in which the child may primarily benefit from additional processing or response time.

4.5. Independence in Daily Life

Mothers in the typical-development group generally described greater independence in daily preparation routines, whereas children in the ASD and intellectual disability groups were more often described as requiring some form of external support. Working memory is important for enabling a child to remember the goal of a daily task, monitor which step they are currently completing, and identify unfinished steps. Rezzagil [37] found a significant relationship between working memory and school readiness and determined that working memory was associated with school-readiness domains such as letters, numbers, shapes, and comparison. Other findings indicate that working memory contributes to children's ability to maintain and follow task instructions [27] and is prospectively associated with later classroom engagement and school-readiness outcomes [38].

The greater independence of typically developing children in daily routines may be explained by the combined development of working memory skills, cognitive flexibility, language, self-regulation, and previous learning experiences. As children repeatedly perform preparation routines, the steps become more automatic, reducing the need to consciously retain each individual step in working memory. Therefore, in the typical development group, maternal support was directed less toward teaching the task step by step and more toward higher-level planning behaviors, such as selecting clothing appropriate for the weather or completing a final check.

In the intellectual disability group, independence appeared to take the form of independence supported by assistance with individual task steps. The child could complete certain parts of the task but required maternal guidance to maintain the sequence, recognize when the task had been completed, or check for an omitted step. In the ASD group, condition-dependent independence was more prominent. The child could act independently when a visual schedule was available, objects were located in their expected places, and transitions were explained in advance; however, performance could decline when these supports were unavailable.

This difference should not be interpreted as indicating that children with ASD or intellectual disability are not independent. Mothers' accounts suggested that children were often described as functioning more independently in situations in which familiar and appropriate supports were available. From an educational perspective, these accounts support the value of gradually reducing assistance when the child can maintain successful performance rather than removing external support abruptly.

4.6. Mothers' Views on Factors Affecting Remembering

Working-memory demands provide one plausible framework for understanding some of the behaviors described by mothers, particularly when children were required to retain several steps, maintain a task goal while acting, or monitor which parts of a routine had already been completed. However, the present findings also indicate that apparently similar errors may arise for different reasons. Difficulty following an instruction may reflect

limitations in retaining task-relevant information, but it may also reflect difficulty understanding the language used, shifting attention from an ongoing activity, coping with sensory input, planning or initiating an action, meeting the motor demands of the task, or sustaining motivation. Anxiety, fatigue, emotional state, and familiarity with the context may further influence whether a child successfully completes a routine. Because these processes were not independently assessed in the present study, mothers' descriptions of forgetting or incomplete task performance should not be interpreted as direct evidence of a working-memory deficit.

This issue is relevant when comparing the three groups. In the intellectual disability group, mothers frequently emphasized the amount and complexity of verbal information and the sequencing of task steps; however, language comprehension, motor abilities, processing speed, and adaptive skills may also have contributed to performance. In the ASD group, mothers more often highlighted explicit language, routines, transitions, sensory conditions, and environmental predictability, indicating that task performance may depend on the interaction between working-memory demands and contextual or regulatory factors. In the typical-development group, mothers more often attributed occasional difficulties to distraction, haste, fatigue, or competing activities. These patterns should therefore be understood as differences in mothers' accounts within this sample rather than as evidence that a single cognitive mechanism explains the behavior of children within any diagnostic group.

4.7. Difficulties Experienced by Mothers and Their Effects on Social Life

The burden of repeated guidance and monitoring was particularly prominent in the accounts of mothers in the ASD and intellectual disability groups. Social misunderstanding and restrictions in participation were also described mainly in these two groups.

The greater burden of repetition and monitoring reported by mothers in the ASD and intellectual disability groups may partly reflect mothers' reports of more frequent external support during daily routines. The mother does not merely provide instructions; she also arranges the environment, prepares visual materials, divides the task into steps, directs the child's attention, and monitors whether the task has been completed. This continuous cognitive and organizational responsibility may cause daily routines to require more time and energy from the mother.

The finding concerning social misunderstanding cannot be explained solely by working memory limitations. People in the social environment may interpret the child's difficulty processing or remembering an instruction as "not listening," "being defiant," "being lazy," or "being spoiled." In particular, the child's ability to complete the task on certain days or in familiar settings may lead others to interpret variability in performance as unwillingness. However, the findings indicate that language, environmental conditions, transitions, and changes in routines affect performance in the ASD group, whereas the length and abstractness of instructions and the number of task steps affect performance in the intellectual disability group.

The findings suggest that the difficulties experienced by mothers in social settings arise not only from the child's skills but also from the meanings attributed to the child's behavior by the social environment. The mother is required both to support the child in completing the task and to explain to others why the child behaves differently. This dual responsibility may restrict the mother's participation in social interactions during visits, at parks, or in group activities.

Social misunderstanding and restricted participation have received relatively little attention in research on working memory. In this context, the burden of repetition and monitoring reported by mothers should be considered not only as a daily challenge but also as a factor that may affect the quality of mother-child interactions over the long term. Nevertheless, these findings should not be explained solely in terms of working memory; the child's communication, adaptive behavior, emotion regulation, and social participation characteristics should also be considered.

The demographic characteristics of the participating mothers provide a contextual framework that should be considered when interpreting the findings. The mean ages of the mothers in the three groups were descriptively similar. However, the proportions of mothers who were employed and had graduate-level education were higher in the typical development group than in the intellectual disability and autism spectrum disorder groups. Maternal education level and employment status may be regarded as microsystem characteristics that could influence access to information and services, the organization of daily time, and the form of support provided to the child [15,16]. However, in the present study, support strategies were not analyzed separately according to maternal education

level or employment status, and the groups were not statistically compared in terms of these variables. Therefore, the support patterns observed across the groups should not be explained solely by the children's developmental status; the potential contribution of the maternal and family context should also be taken into account.

Support appeared to be most appropriate when it was matched to the child's current performance and context rather than selected on the basis of diagnosis alone. Because the study was cross-sectional, it was not possible to determine whether mothers systematically reduced support as children became more independent; longitudinal research is needed to examine this process.

From an educational perspective, the findings highlight the importance of aligning support across home and early childhood education settings while avoiding a one-size-fits-all approach based on diagnosis. Educational experiences may also contribute to the development of working-memory-related performance. Recent longitudinal evidence indicates that participation in pre-kindergarten education was associated with subsequent working-memory development in autistic children, although the timing and pattern of these associations differed across developmental periods [39]. Strategies such as reducing the verbal load of instructions, externalizing task sequences through visual supports, providing sufficient response time, using reminder questions, and gradually fading prompts may be incorporated into family education and classroom routines according to the child's individual performance. Collaboration between families, teachers, and practitioners may also help identify which aspects of a task create difficulty for a particular child and support the consistent use of appropriate cues across everyday contexts.

Limitations:

This study has several limitations that should be considered when interpreting the findings. First, children's working memory was not directly assessed using standardized performance-based measures or rating instruments. Similarly, cognitive functioning, receptive and expressive language abilities, attentional characteristics, adaptive functioning, ASD support needs, and intellectual-disability severity were not systematically assessed. Although chronological age and sex were available for describing the children represented in each maternal group, the groups were not matched on these characteristics. Consequently, the behaviors described by mothers should not be interpreted as direct indicators of working-memory capacity, and some of the variation observed within and across groups may reflect unmeasured developmental characteristics rather than diagnostic status alone.

Second, the study relied on mothers' accounts of their children's everyday behavior and the support strategies they used. Maternal reports offer valuable information about naturally occurring routines and family experiences; however, the findings were not triangulated through direct observations, child performance measures, teacher reports, or reports from other caregivers. Mothers' descriptions of their own support practices may also have been influenced by recall or social-desirability processes. The findings therefore represent mothers' perceptions and interpretations of everyday experiences rather than independently verified measures of children's performance.

Third, variation in the mode and documentation of the interviews may have influenced the qualitative depth of the dataset. Forty-three interviews were conducted face-to-face and 47 were conducted online via Zoom. Although the same interview protocol, question order, and probing procedures were used across both formats, differences in rapport, privacy, technological conditions, and access to nonverbal or contextual information may have affected participants' responses. In addition, 18 interviews were documented through detailed notes because participants did not consent to audio recording. Although these notes were expanded immediately after each interview and analyzed using the same coding framework, they did not provide the same level of verbatim detail as the audio-recorded interviews. Because interview mode and recording status were not treated as analytical grouping variables, their possible influence on code prominence or thematic emphasis cannot be separated from other sources of variation.

Fourth, the sampling and recruitment procedures limit the transferability of the findings. Participants were recruited through special education and rehabilitation centers and preschool education institutions in two districts of Gaziantep Province. Families who were already accessing institutional services may differ from families with limited or no access to such services. In addition, excluding children with multiple neurodevelopmental diagnoses resulted in a more diagnostically defined sample and may limit the applicability of the findings to children with more complex developmental profiles. The findings should therefore be transferred cautiously to families from different service, socioeconomic, cultural, or regional contexts.

Fifth, only mothers participated in the study. The perspectives of fathers, teachers, other caregivers, and children themselves were not examined. Future studies incorporating multiple informants and direct observations across home and educational settings may provide a more comprehensive understanding of how everyday tasks

involving working-memory demands are experienced and supported across contexts.

Finally, the use of probing questions concerning particular forms of support may have facilitated participants' recall of some strategies. In addition, frequencies and percentages were used to make qualitative patterns within the sample more transparent rather than to estimate prevalence or test group differences. Because no inferential statistical comparisons were conducted, numerical differences between groups should be interpreted descriptively and together with the content and context of mothers' accounts.

5. Conclusions

Maternal support during everyday tasks involving working-memory demands varied according to the child's performance and the demands of the situation rather than following a fixed set of diagnosis-specific strategies. Although different support patterns were more prominent across the three groups, the mothers' accounts also showed that instruction following and routine completion were shaped by language, attention, sensory and contextual conditions, motivation, adaptive functioning, and previous learning experiences. Accordingly, visual supports, task segmentation, reminder questions, repetition, and wait time should be regarded primarily as ways of adjusting task demands and supporting functional participation rather than as interventions that can be assumed to directly increase working-memory capacity.

5.1. Recommendations for Practice

For families: Support may be organized as a gradual sequence: first identify where the child experiences difficulty within the routine; reduce the amount or complexity of information presented at one time; add visual, verbal, gestural, or environmental support when needed; allow sufficient opportunity for the child to respond independently; use reminder questions before directly providing the answer; and gradually fade support once performance becomes more stable. The type and intensity of assistance should be adjusted according to the child's communication, attention, sensory, motor, adaptive, and learning characteristics rather than diagnosis alone.

For teachers and practitioners: Educational and family-support programs may help caregivers identify the specific demands of everyday tasks, conduct simple task analyses, prepare visual supports, use consistent prompting hierarchies, and systematically fade assistance. Practitioners may individualize support by first identifying the point at which performance breaks down within a routine. When difficulty follows lengthy verbal instructions, verbal load can be reduced and steps can be presented one at a time; when the child loses track of the sequence, visual schedules or checklists may be introduced; when transitions or sensory conditions interfere with performance, advance cues and environmental modifications may be used; and when the child can complete the routine with minimal assistance, wait time can be increased and prompts gradually faded. The child's response to each support should guide whether that support is maintained, modified, or reduced. Coordination between home and educational settings may also help ensure that similar routines, cues, and expectations are used across contexts when appropriate. Because mothers in the study described a substantial burden associated with repeated prompting and monitoring, practitioners should consider caregiver feasibility and burden when recommending support strategies rather than focusing solely on child performance.

Accordingly, public awareness initiatives may include information emphasizing that difficulties following instructions among children with developmental disabilities should not be interpreted as unwillingness or behavioral problems.

5.2. Recommendations for Future Research

Future studies are recommended to examine maternal reports together with standardized working memory measures, observations in natural settings, teacher reports, and data concerning children's language and adaptive behavior levels. Future studies should also examine language, attention, motor performance, sensory characteristics, and motivation alongside working-memory measures to clarify which processes contribute to difficulties observed during everyday multistep tasks. Studies in which diagnostic groups are divided into subgroups according to the severity of disability and level of support needs may also clarify the child profiles for which the patterns identified in the present study are applicable. The use of longitudinal designs to examine how the support provided by mothers changes over time, as well as the inclusion of the views of fathers and other caregivers, would contribute

to the literature.

Author Contributions

Conceptualization, H.G. and M.T.; methodology, H.G. and M.T.; software, H.G. and M.T.; validation, H.G. and M.T.; formal analysis, H.G. and M.T.; investigation, H.G. and M.T.; resources, H.G. and M.T.; data curation, H.G. and M.T.; writing—original draft preparation, H.G. and M.T.; writing—review and editing, H.G. and M.T.; visualization, H.G. and M.T.; project administration, H.G. and M.T. Both authors contributed equally to all stages of the research. Both authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement

The study was conducted in accordance with the Declaration of Helsinki and approved by the Gaziantep University Social Sciences and Humanities Scientific Research and Publication Ethics Committee (Meeting No. 05, Decision No. 39, Application No. 2026-02-0087; approval date: 2 March 2026).

Informed Consent Statement

Written informed consent was obtained from all participants involved in the study after they had been informed about the purpose and scope of the research, the intended use of the data, and their right to withdraw from the study at any time without providing a reason. Separate written consent was obtained from participants whose interviews were audio-recorded. All personal and institutional identifiers were removed from the transcripts and participant quotations.

Data Availability Statement

The qualitative data generated and analyzed during the current study are not publicly available because the interview transcripts may contain potentially identifiable information and are protected by participant confidentiality and ethical restrictions.

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Conflicts of Interest

The authors declare no conflict of interest.

AI Use Statement

During the preparation and revision of this manuscript, the authors used Grammarly for grammar checking, language refinement, and readability improvement, and ChatGPT (OpenAI) to assist with language editing and organization of the manuscript. No AI tools were used for data collection, coding, qualitative data analysis, calculation of findings, or independent interpretation of the study results. All AI-assisted outputs were critically reviewed, verified, and edited by the authors. The authors take full responsibility for the accuracy, integrity, interpretation, and final content of the manuscript. AI-assisted language editing was not applied to participants' quotations. All English translations of participant quotations were checked by the authors against the original Turkish interview data to preserve their intended meaning.

References

1. Baddeley, A. Working memory: Looking back and looking forward. *Nat. Rev. Neurosci.* **2003**, *4*, 829–839. [[CrossRef](#)]

2. Doğan, M. Working memory, academic learning, and learning disabilities in children. *Turk. Psikol. Yaz.* **2011**, *14*, 48–65. (in Turkish)
3. Baddeley, A.D.; Hitch, G.J. Working Memory. *Psychol. Learn. Motiv.* **1974**, *8*, 47–89. [CrossRef]
4. Baddeley, A. The episodic buffer: A new component of working memory? *Trends Cogn. Sci.* **2000**, *4*, 417–423. [CrossRef]
5. López-Vallejo, S.; Burneo-Garcés, C.; Pérez-García, M. Development of working memory and inhibitory control in early childhood: Cross-sectional analysis by age intervals and gender in Ecuadorian preschoolers. *PLoS ONE* **2024**, *19*, e0299394. [CrossRef]
6. Shvartsman, M.; Shaul, S. The role of working memory in early literacy and numeracy skills in kindergarten and first grade. *Children* **2023**, *10*, 1285. [CrossRef]
7. Davidson, C.; Shing, Y.L.; McKay, C.; et al. The first year in formal schooling improves working memory and academic abilities. *Dev. Cogn. Neurosci.* **2023**, *60*, 101205. [CrossRef]
8. An, W.; Ding, Z.; Zhu, Z.; et al. Verbal working memory in children and adolescents with autism spectrum disorders: A meta-analysis review. *Acta Psychol.* **2025**, *259*, 105253. [CrossRef]
9. Howard, J.; Herold, B.; Major, S.; et al. Associations between executive function and attention abilities and language and social communication skills in young autistic children. *Autism* **2023**, *27*, 2135–2144. [CrossRef]
10. Edmunds, S.R.; Colman, C.; Vidal, P.; et al. Brief report: Examining the links between language processes and working memory impairments in toddlers and preschoolers with ASD. *J. Autism Dev. Disord.* **2022**, *52*, 1872–1880. [CrossRef]
11. Van der Molen, M.J.; Van Luit, J.E.H.; Jongmans, M.J.; et al. Verbal working memory in children with mild intellectual disabilities. *J. Intellect. Disabil. Res.* **2007**, *51*, 162–169. [CrossRef]
12. Schuchardt, K.; Gebhardt, M.; Maehler, C. Working memory functions in children with different degrees of intellectual disability. *J. Intellect. Disabil. Res.* **2010**, *54*, 346–353. [CrossRef]
13. Xie, T.; Ma, H.; Wang, L.; et al. Can enactment and motor imagery improve working memory for instructions in children with autism spectrum disorder and children with intellectual disability? *J. Autism Dev. Disord.* **2024**, *54*, 131–142. [CrossRef]
14. Roording-Ragettie, S.L.; Pieters, S.; Wennekers, E.; et al. Working memory training in children with neurodevelopmental disorders and intellectual disabilities, the role of coaching: A double-blind randomised controlled trial. *J. Intellect. Disabil. Res.* **2023**, *67*, 842–859. [CrossRef]
15. Bronfenbrenner, U. Ecological Models of Human Development. In *International Encyclopedia of Education*, 2nd ed.; Husén, T., Postlethwaite, T.N., Eds.; Pergamon/Elsevier Science: Oxford, UK, 1994; 3, pp. 1643–1647.
16. Bronfenbrenner, U.; Morris, P.A. The Bioecological Model of Human Development. In *Handbook of Child Psychology: Vol. 1. Theoretical Models of Human Development*, 6th ed.; Lerner, R.M., Ed.; Wiley: Hoboken, NJ, USA, 2006; pp. 793–828. [CrossRef]
17. Wood, D.; Bruner, J.S.; Ross, G. The role of tutoring in problem solving. *J. Child Psychol. Psychiatry* **1976**, *17*, 89–100. [CrossRef]
18. Koskulu-Sancar, S.; van de Weijer-Bergsma, E.; Mulder, H.; et al. Examining the role of parents and teachers in executive function development in early and middle childhood: A systematic review. *Dev. Rev.* **2023**, *67*, 101063. [CrossRef]
19. Castelo, R.J.; Meuwissen, A.S.; Distefano, R.; et al. Parent provision of choice is a key component of autonomy support in predicting child executive function skills. *Front. Psychol.* **2022**, *12*, 773492. [CrossRef]
20. Khurana, A.; Leonard, H.; Michaelson, L.E.; et al. Transactional linkages between parenting behaviors and child executive functions and self-regulation from early childhood to adolescence. *J. Person-Oriented Res.* **2024**, *10*, 26–55. [CrossRef]
21. Buschmann, A.; Multhauf, B.; Hasselhorn, M.; et al. Long-term effects of a parent-based language intervention on language outcomes and working memory for late-talking toddlers. *J. Early Interv.* **2015**, *37*, 175–189. [CrossRef]
22. Sağlam, C.; Özyürek, A. Investigation of working memory and early literacy skills in preschool children. *Erken Çocuk. Çalış. Derg.* **2022**, *6*, 82–101. (in Turkish) [CrossRef]
23. Diamond, A.; Lee, K. Interventions shown to aid executive function development in children 4 to 12 years old. *Science* **2011**, *333*, 959–964. [CrossRef]
24. Gathercole, S.E. Working memory in the classroom. *Psychologist* **2008**, *21*, 382–385.
25. Oran, Ü. Investigation of the Effect of a Working Memory Intervention Program on the Language Skills and Working Memory Performance of Children with Mild Intellectual Disabilities. Master's Thesis, Marmara University, Istanbul, Türkiye, 2024.

26. Turley-Ames, K.J.; Whitfield, M.M. Strategy training and working memory task performance. *J. Mem. Lang.* **2003**, *49*, 446–468. [CrossRef]
27. Gathercole, S.E.; Alloway, T.P. *Working Memory and Learning: A Practical Guide for Teachers*; SAGE Publications: London, UK, 2008.
28. Bernier, A.; Carlson, S.M.; Whipple, N. From external regulation to self-regulation: Early parenting precursors of young children's executive functioning. *Child Dev.* **2010**, *81*, 326–339. [CrossRef]
29. Fay-Stammbach, T.; Hawes, D.J.; Meredith, P. Parenting influences on executive function in early childhood: A review. *Child Dev. Perspect.* **2014**, *8*, 258–264. [CrossRef]
30. Elo, S.; Kyngäs, H. The qualitative content analysis process. *J. Adv. Nurs.* **2008**, *62*, 107–115. [CrossRef]
31. Yıldırım, A.; Şimşek, H. *Qualitative Research Methods in the Social Sciences*, 12th ed.; Seçkin Yayıncılık: Ankara, Türkiye, 2021. (in Turkish)
32. Lincoln, Y.S.; Guba, E.G. *Naturalistic Inquiry*; Sage Publications: Beverly Hills, CA, USA, 1985.
33. Miles, M.B.; Huberman, A.M. *Qualitative Data Analysis: An Expanded Sourcebook*, 2nd ed.; Sage Publications: Thousand Oaks, CA, USA, 1994.
34. Wolfe, C.D.; Bell, M.A. Sources of variability in working memory in early childhood: A consideration of age, temperament, language, and brain electrical activity. *Cogn. Dev.* **2007**, *22*, 431–455. [CrossRef]
35. Cowan, N. The magical number 4 in short-term memory: A reconsideration of mental storage capacity. *Behav. Brain Sci.* **2001**, *24*, 87–114. [CrossRef]
36. Rezzagil, M.; Akman, B. Validity and reliability study of the working memory rating scale in early childhood. *Eğitim Kuram Uygul. Araşt. Derg.* **2021**, *7*, 158–179. (in Turkish) [CrossRef]
37. Rezzagil, M. Investigation of the Relationship Between Working Memory and School Readiness in Early Childhood. PhD Thesis, Hacettepe University, Ankara, Türkiye, 2018.
38. Fitzpatrick, C.; Pagani, L.S. Toddler working memory skills predict kindergarten school readiness. *Intelligence* **2012**, *40*, 205–212. [CrossRef]
39. Kim, S.A. The long-lasting benefits of pre-kindergarten education on autistic children's working memory development. *Autism* **2025**, *29*, 155–168. [CrossRef]



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