



VNIVERSITAT D VALÈNCIA

Facultad de Psicología y Logopedia

**Dificultades Lectoras en Castellano: Funcionamiento
Ejecutivo, Problemas Internalizantes y
Externalizantes. Incidencia de las comorbilidades**

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Visto bueno del Director de la Tesis Doctoral

D. MANUEL SORIANO FERRER, Profesor Titular de Psicología Evolutiva y de la Educación de la Universidad de Valencia,

CERTIFICA,

que la tesis titulada *Dificultades Lectoras en Castellano: Funcionamiento Ejecutivo, Problemas Internalizantes y Externalizantes. Incidencia de las comorbilidades*, presentada por Manuel Ramón Morte Soriano para optar por el grado de Doctor, ha sido realizada en el Departamento de Psicología Evolutiva y de la Educación de la Universidad de Valencia, Programa de Investigación en Psicología bajo mi dirección. Hago constar mi autorización para que se realicen los trámites conducentes a su defensa..

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Fdo. Manuel Soriano Ferrer

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Q1

*A mis padres, María y Ramón
y a mi pareja, Eva*

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RESUMEN

El proceso de aprender a leer está plagado de dificultades y frustraciones para algunos niños. Estas dificultades específicas de aprendizaje de la lectura, conocidas como dislexia, constituyen un trastorno de origen neurológico que persiste a lo largo de la vida a pesar de que el individuo tenga la inteligencia, la educación y el entorno socioeconómico adecuados para aprender a leer. Los individuos con dislexia tienen dificultades para reconocer palabras con precisión o fluidez. Además de las dificultades en el plano académico, tiene consecuencias negativas en los planos personal y familiar, entre otros. Por ello, en esta tesis se presentan 4 artículos que analizan las funciones ejecutivas en los contextos de desarrollo (familia y escuela), los problemas internalizantes y externalizantes, incluso durante el confinamiento por Covid-19, así como su impacto en la familia.

Método. El estudio 1 analizó las funciones ejecutivas en 78 alumnos con dislexia en la familia y en la escuela comparándolos con 82 niños con desarrollo típico, mediante cuestionarios de estimación conductual de la función ejecutiva (BRIEF-2). El estudio 2 analizó los problemas de internalizantes y externalizantes mediante autoinformes y escalas de estimación conductual para padres y profesores en 34 adolescentes con dislexia, 28 niños con dislexia y trastorno por déficit de atención con hiperactividad (TDAH), subtipo combinado y 33 adolescentes con desarrollo típico. En el estudio 3 se analizó el impacto que la dislexia, con y sin TDAH, tenía sobre el estrés parental y las estrategias de crianza. Para ello participaron las familias de los adolescentes del estudio 2. El estudio 4 analizó la incidencia que el confinamiento por Covid-19 tenía sobre los problemas internalizantes y externalizantes de 32 estudiantes con dislexia como sobre sus familias.

Resultados. El estudio 1 encontró que tanto padres como profesores consideraban que los niños y adolescentes con dislexia presentaban con mayor frecuencia dificultades cognitivas, conductuales y emocionales de funcionamiento ejecutivo en casa y en la escuela con comparación con los alumnos con desarrollo típico. Sin embargo, los profesores informaron de una mayor gravedad de las deficiencias que los padres en varios ámbitos de la función ejecutiva, lo que podría sugerir un patrón diferencial de dificultades entre el hogar y la escuela. El estudio 2 muestra que los adolescentes de los grupos Dislexia y Dislexia + TDAH-Combinado tenían más depresión y declaraban problemas de ansiedad con un porcentaje muy alto por encima del punto de corte clínico que los adolescentes con desarrollo típico. Tanto los informes de los padres como los de los profesores mostraron que los grupos Dislexia y Dislexia + TDAH-Combinado obtuvieron valores medios más altos y un mayor número de adolescentes por encima del punto de corte clínico de problemas internalizantes, externalizantes y totales que el grupo de adolescentes con desarrollo típico. Además, el grupo comórbido Dislexia + TDAH-Combinado presentó los mayores problemas internalizantes y externalizantes. El estudio 3 muestra que los padres de los adolescentes del grupo comórbido Dislexia + TDAH-Combinado experimentaron un nivel más alto de estrés, tanto en angustia parental, interacciones disfuncionales padre-hijo, niño difícil y estrés total, en comparación con los otros dos grupos, dislexia y desarrollo típico. Además, los padres de los adolescentes con dislexia también experimentaron mayor estrés en todas las subescalas que las familias con hijos con desarrollo típico. En relación con los estilos de crianza, los resultados muestran que los padres de los adolescentes de los grupos Dislexia y Dislexia + TDAH-Combinado utilizaron más estrategias de crianza disfuncionales (por ejemplo, reactividad excesiva) que los padres de los adolescentes con desarrollo típico. El estudio 4 muestra que, durante la cuarentena, los niños y adolescentes con dislexia tenían mayores niveles

de síntomas de depresión y ansiedad, y los padres percibían que sus síntomas emocionales, hiperactividad-inatención y problemas de conducta se incrementaron con respecto a la pre-cuarentena. Durante la cuarentena, los niños y adolescentes con dislexia también mostraban menos actividad lectora y menor motivación por la lectura. Los padres también informaron de un estrés significativamente mayor estrés durante la cuarentena en comparación con las condiciones previas a la cuarentena. Algunas variables demográficas y psicológicas predijeron el estado de ansiedad de los niños y el estrés de los padres. Los padres también informaron de algunas dificultades: a) dificultades para establecer rutinas de estudio, (b) que la cuarentena afectaba negativamente al aprendizaje de su hijo y (c) que no recibían suficiente ayuda de los profesores sobre cómo apoyar el aprendizaje de su hijo. Además, la gran mayoría de los padres estaban muy preocupados por el aprendizaje y el éxito escolar del niño, la motivación y el interés del niño por la lectura, las relaciones del niño con sus compañeros y las aptitudes profesionales del profesor del niño.

Conclusiones. Los estudios muestran que la dislexia, además de los problemas académicos, tiene consecuencias negativas en otros planos del desarrollo personal y familiar, especialmente cuando la dislexia se presenta de forma comórbida al TDAH, subtipo combinado. Estos hallazgos destacan la necesidad de ampliar las evaluaciones a dominios del funcionamiento ejecutivo y problemas internalizantes y externalizantes, así como al contexto familiar, implicando múltiples informantes (p.e. el estudiante, sus padres y profesores), con el fin de caracterizar mejor las necesidades que experimentan a nivel académico, a nivel personal y a nivel familiar. Al detectar las dificultades podremos ofrecerles programas preventivos y/o de intervención que mitiguen sus dificultades. De esta forma podremos ofrecerles a los alumnos y a sus familias la ayuda que necesiten.

1.- INTRODUCCION GENERAL

El proceso de aprender a leer está plagado de dificultades y frustraciones para algunos niños. La última edición del Sistema Diagnóstico y Estadístico de los Trastornos Mentales (APA, 2023) engloba estas dificultades lectoras, conocidas con el término dislexia, dentro de los «trastornos específicos del aprendizaje», que impiden la capacidad de aprender o utilizar habilidades académicas específicas como la lectura, la escritura o la aritmética. Estas dificultades específicas de aprendizaje de la lectura constituyen un trastorno de origen neurológico que persiste a lo largo de la vida a pesar de que el individuo tenga la inteligencia, la educación y el entorno socioeconómico adecuados para aprender a leer (APA, 2023). Los individuos con dislexia tienen dificultades para reconocer palabras con precisión o fluidez (Shaywitz et al., 2008; Snowling & Hulme, 2012), pero la velocidad/fluidez lectora se considera el principal indicador de dislexia en lengua española, mientras que la precisión lectora puede mantenerse relativamente intacta (Serrano y Defior, 2008; Soriano-Ferrer y Miranda-Casas, 2010; Suárez-Coalla & Cuetos, 2012).

La prevalencia de la dislexia se ha estimado entre el 5 y el 15% de los niños en edad escolar, dependiendo de la lengua y la cultura (APA, 2023). Concretamente en España, la prevalencia estimada oscila entre el 3.2% y el 5.9% en alumnos de primaria (Jiménez, et al., 2009) y entre el 3.5% y el 5.6% en alumnos de secundaria, en función de diferentes criterios de severidad (González, et al., 2010) o el 11.8% con dificultades ortográficas incluidas con la dislexia (Carrillo, et al., 2011).

Mucho más clarificadoras resultan las conclusiones de un reciente meta-análisis internacional a nivel mundial, realizado por Yang et al. (2022), que establece una prevalencia de 7.1%, siendo mucho más frecuente en varones (9.2%) que en mujeres

(4.66%). Tradicionalmente se había planteado que la prevalencia, así como las manifestaciones, de la dislexia era mucho menor en lenguas alfabéticas más transparentes, como el español, donde la correspondencia grafema-fonema es consistente o transparente, que en ortografías menos consistentes o menos transparentes, como el inglés (Joshi & Aaron, 2006; Wydell, 2012). No obstante, los resultados de este meta-análisis no encuentran diferencias significativas en la prevalencia en función del sistema de escritura (7.26% en lenguas alfabéticas, 6.98% en lenguas logográficas) ni entre la transparencia / profundidad del sistema ortográfico (7.13% en ortografías transparentes/ superficiales y 7.55% en ortografías opacas / profundas). Cabe destacar que la mayoría de los trabajos tenían muestras de tamaño pequeñas y han empleado definiciones operativas diversas, lo que dificulta las comparaciones.

Por su parte, Cubilla-Bonnetier (2024) realizó un meta-análisis de 16 estudios de prevalencia en países donde se habla español, encontró una prevalencia promedio de 7.52%, oscilando entre el 5.15% y el 10.91%.

Aunque el concepto más consistente y duradero inherente de cualquier definición de dislexia es probablemente su carácter inesperado (Shaywitz, et al., 2008; Soriano-Ferrer, 2014) se están acumulando pruebas que sugieren que los estudiantes con dislexia evolutiva pueden mostrar una serie de déficits cognitivos relacionados con la lectura (Vellutino, et al., 2004) como por ejemplo, conciencia fonológica, denominación rápida, memoria de trabajo verbal y visual-espacial, y procesamiento ejecutivo, así como deficiencias académicas entre las que podemos encontrar las dificultades en la lectura de pseudopalabras, la ortografía, y el vocabulario, en comparación con los lectores promedio, con tamaños del efecto de moderados a altos, como refleja el metaanálisis realizado por Kudo, Lussier y Swanson (2015).

1.1.- Funcionamiento Ejecutivo en las Dificultades Lectoras

La función ejecutiva es un constructo multidimensional que implica habilidades como la planificación, la iniciación, la memoria de trabajo, el autocontrol (inhibición y supervisión del rendimiento), velocidad de procesamiento, atención y cambio de tarea, cada una importante para el control deliberado de acciones orientadas a objetivos (Zelazo, et al., 2003, 2016; Zelazo & Müller, 2002). Aunque no existe una definición universalmente consensuada de funciones ejecutivas, la mayoría de las conceptualizaciones incluyen varias habilidades relacionadas pero separadas asociadas con comportamientos con propósito, orientados a objetivos y de resolución de problemas que apoyan la regulación cognitiva, emocional y conductual (Castellanos et al., 2018; Hofmann et al., 2012; Lezak et al., 2004).

En los últimos años, un creciente número de investigaciones sugiere que los niños y adolescentes con dislexia también pueden manifestar dificultades en el funcionamiento ejecutivo. Las funciones ejecutivas principales en las que se basa la lectura son la inhibición, la memoria de trabajo, la velocidad de procesamiento, cambio del foco atencional y el autocontrol (Booth et al., 2010, 2014).

Estudios previos con tareas basadas en el rendimiento han identificado déficits en un subdominio del funcionamiento ejecutivo tanto en niños como en adolescentes con dislexia (Altemeier, Abbott, & Berninger, 2008; Brosnan, Demetre, Hamill, Robson Shepherd et al., 2002; Helland & Asbjornsen, 2000; Horowitz-Kraus, 2014; Kraus & Horowitz-Kraus, 2015; Menghini, Carlesimo, Marotta, Finzi, & Vicari, 2010; Moura, Simões & Pereira, 2015; Reiter, Tucha, & Lange, 2005; Tiffin-Richards, Hasselhorn, Woerner, Rothenberger, & Banaschewski, 2008; Varvara, Varuzza, Sorrentino, Vicari, Menghini, 2014).

Los hallazgos mencionados coinciden en destacar el papel influyente de la funciones ejecutivas en las dificultades lectoras. En estos estudios, la función ejecutiva se ha evaluado utilizando pruebas clínicas en situaciones de laboratorio (pruebas basadas en el rendimiento). Debido a que estas tareas se administran normalmente fuera del entorno natural del niño y del adolescente, el rendimiento ejecutivo de los niños y adolescentes puede no ser representativo de cómo funcionan en contextos cotidianos. Precisamente, el modelo de función ejecutiva propuesto por Gioia y sus colegas (Gioia et al., 2000, 2015) intenta incorporar las habilidades emocionales, conductuales y cognitivas que se describen ampliamente como habilidades ejecutivas.

La primera versión de este modelo intentó obtener información más detallada sobre los subprocesos de la función ejecutiva. Utilizando el Behavior Rating Inventory of Executive Function (BRIEF), el modelo original incluía ocho escalas que se agrupaban en un factor de regulación conductual y otro metacognitivo (Gioia et al., 2000). Sin embargo, una reorganización posterior del modelo en nueve subescalas encontró evidencia de tres factores o dominios subyacentes de funciones ejecutivas: un factor de regulación cognitiva, un factor de regulación conductual y un factor de regulación emocional (Gioia et al., 2002a). Es importante destacar que esta revisión y reorganización del BRIEF no contenía nuevos ítems, lo que permitió la comparación directa de las puntuaciones entre versiones. En el estudio de Gioia et al. (2002a), se reexaminó el contenido de los ítems de la escala Monitoreo y se planteó la hipótesis de que reflejaba dos dimensiones distintas (es decir, la capacidad de uno para monitorizar las actividades relacionadas con la tarea o monitorizar las actividades personales) que se asociaban de forma diferente con los factores de regulación cognitiva y regulación conductual, respectivamente. Múltiples estudios posteriores utilizando análisis factorial exploratorio

y/o confirmatorio (Byerley & Donders, 2013; Egeland & Fallmyr, 2010; Gioia et al., 2015; Peters et al., 2012) apoyaron la visión multidimensional del modelo de función ejecutiva de Gioia y colegas (2002a), así como los dominios cognitivo, conductual y emocional.

Las características generales de los tres dominios descritos en este modelo son las siguientes. El dominio cognitivo de la función ejecutiva se refiere al grado de dificultad que tiene una persona para intentar controlar o gestionar sus procesos cognitivos y la resolución de problemas de forma eficaz. Este dominio cognitivo incluye procesos como la identificación y planificación para alcanzar objetivos futuros, la puesta en marcha de esfuerzos para implementar planes, el seguimiento del progreso hacia la consecución de objetivos y la utilización de la memoria de trabajo. El ámbito conductual de la función ejecutiva se refiere al grado de dificultad que tiene una persona para regular y supervisar sus conductas de forma eficaz; incluye la capacidad de inhibir respuestas conductuales que no son relevantes para la consecución de objetivos y de supervisar la conducta propia y la de los demás para calibrar adecuadamente las respuestas conductuales. El ámbito emocional de la función ejecutiva refleja el grado de dificultad que tiene una persona para regular sus respuestas emocionales, especialmente en respuesta a situaciones cambiantes; incluye habilidades relacionadas con la modulación adecuada de las respuestas emocionales, así como la flexibilidad al cambiar de una situación a otra o de una tarea a otra.

Aunque ha habido diferentes estudios que han utilizado escalas de valoración de la función ejecutiva para individuos con trastorno por déficit de atención con hiperactividad (TDAH; por ejemplo, Jacobson et al., 2016), discapacidades matemáticas (Holm et al., 2018), trastornos específicos del lenguaje (Wittke et al., 2013), dificultades de

comprensión lectora (Locascio et al., 2010) y otros trastornos del neurodesarrollo y psicopatologías (véase Gioia et al., 2002b; Snyder et al., 2015; Wochos et al., 2014), solo se conocen cuatro estudios que hayan utilizado una escala de valoración conductual para examinar la función ejecutiva en estudiantes con dislexia. Por ejemplo, Gioia et al. (2002b) utilizaron la versión para padres del BRIEF con 34 niños angloparlantes con dificultades lectoras y encontraron déficits de funcionamiento ejecutivo en la regulación cognitiva (es decir, memoria de trabajo, planificación-organización), y en la regulación del comportamiento (es decir, escalas de inhibición), con un 62% (memoria de trabajo), 47% (planificación-organización) y 29% (inhibición) de estos niños cumpliendo el rango de Significación Clínica en esas escalas.

Locascio et al. (2010) administraron la versión para padres del BRIEF a los padres de 44 niños angloparlantes de 10 a 14 años con déficits en el reconocimiento de palabras. Encontraron que los padres cuyos hijos tenían habilidades deficientes en el reconocimiento de palabras calificaron a sus hijos con niveles significativamente más bajos de función ejecutiva que los niños con problemas de comprensión lectora y los controles. Sin embargo, en este estudio sólo se informaba de las puntuaciones del Índice Ejecutivo Compuesto Global, y esta puntuación resumida global, que abarca facetas cognitivas, conductuales y emocionales de la función ejecutiva, no revela las habilidades específicas de la función ejecutiva que los padres de niños con dislexia suelen calificar como problemáticas. Como se ha señalado anteriormente, la comprensión de los puntos fuertes y débiles específicos de cada área tiene importantes implicaciones para la comprensión global de las habilidades de función ejecutiva de un individuo y para el desarrollo de apoyos específicos cuando los puntos débiles son significativos.

De forma similar a los hallazgos de Gioia y sus colegas (2002b), Schöfl et al. (2014) descubrieron que 17 niños germanoparlantes con dislexia (en comparación con un grupo de control sin dislexia) tenían más dificultades de regulación cognitiva con la memoria de trabajo y la planificación-organización. Más recientemente, Smith-Spark et al. (2016) mostraron que 31 adultos angloparlantes con dislexia autoinformaron de problemas de función ejecutiva más frecuentes, centrándose estas dificultades en los procesos metacognitivos (memoria de trabajo, planificación, seguimiento de tareas y organización), más que en la regulación de la emoción y el comportamiento. Sin embargo, aunque no se alcanzó la significación estadística, los adultos con dislexia presentaban una menor función ejecutiva en cuanto a la regulación de la emoción y el comportamiento.

En general, estos estudios anteriores sobre función ejecutiva en alumnos con dislexia muestran que, en un contexto familiar, los padres calificaron a los niños con dislexia como niños con dificultades de función ejecutiva en diferentes ámbitos. Curiosamente, ningún estudio anterior ha incluido a profesores de escuela para informar sobre la función ejecutiva de niños con dislexia. Esto es importante porque los dominios de la función ejecutiva (es decir, cognitivo, conductual y emocional) son distintos y su naturaleza multidimensional indica que las dificultades específicas de función ejecutiva pueden aparecer en dominios singulares o múltiples a través de diferentes contextos y demandas específicas del entorno (Goldberg & Podell, 2000). Por ejemplo, los entornos del hogar y de la escuela difieren en las demandas cognitivas, así como en las normas de expresión conductual y emocional (Allan y Gilbert, 2002). Por lo tanto, es necesario evaluar la función ejecutiva en diferentes contextos (por ejemplo, en casa y en la escuela) para entender cómo los disléxicos utilizan la función ejecutiva en respuesta a las diferentes demandas específicas del entorno. Una evaluación de este tipo permite una

valoración más exhaustiva y la posibilidad de examinar posibles acuerdos y desacuerdos entre los informantes (por ejemplo, padres y profesores).

Aunque un pequeño número de estudios previos han intentado medir la función ejecutiva en niños y adolescentes con dislexia, esta base de investigación sigue siendo bastante limitada. Por ejemplo, ningún estudio previo que utilice escalas de valoración de la función ejecutiva en jóvenes con dislexia ha utilizado múltiples informantes (por ejemplo, padres y profesores), aunque la evaluación de múltiples informantes es crítica porque las habilidades de función ejecutiva se requieren en múltiples contextos, como ser capaz de inhibir un comportamiento inapropiado o recordar una secuencia de tareas (Reynolds y Horton, 2008; Zelazo et al., 2016). Además, sólo dos estudios anteriores compararon los dominios de las calificaciones de función ejecutiva entre niños o adolescentes con y sin dislexia, y ambos estudios tenían una muestra relativamente pequeña de participantes con dislexia ($n = 17$ y 34).

1.2.- Los problemas internalizantes y externalizantes en los alumnos con dislexia.

Tradicionalmente, en psicopatología infantil (Achenbach y Rescorla, 2001), el comportamiento internalizado se refiere a problemas que ocurren principalmente dentro de uno mismo como ansiedad, depresión, aislamiento social y quejas somáticas. Por otro lado, el comportamiento externalizado incluye los conflictos con otras personas y se caracteriza por la impulsividad, la hiperactividad, la agresividad y el incumplimiento de las normas. Además de las dificultades académicas, los alumnos con dislexia tienen un alto riesgo de padecer problemas de salud mental, que comúnmente incluyen medidas de problemas de interiorización (Carroll et al., 2005; Swanson y Vaughn, 2016; Hendren et al., 2018; Lee y Bukouski, 2012; Panicker y Celliah, 2016; Wilcutt y Pennington, 2000)

así como altos niveles de problemas de exteriorización Swanson y Vaughn, 2016; Hendren et al., 2018; Heiman y Olenik-Shemesh, 2020).

Los estudiantes con dislexia pueden ser más vulnerables a experimentar trastornos interiorizados (por ejemplo, ansiedad y depresión), posiblemente debido a una baja opinión de la competencia académica unida a repetidas experiencias de fracaso académico (Panicker y Celliah, 2016; Boyes et al., 2018; Zuppardo et al., 2023). Por ejemplo, un metaanálisis de Nelson y Harwood (2011a) de 42 estudios reveló que alrededor del 70% de los estudiantes con dificultades de aprendizaje experimentaban mayores síntomas de ansiedad que los estudiantes sin dificultades de aprendizaje. Otro meta-análisis de Nelson y Harwood (2011b) realizado para comprender la depresión entre los estudiantes con dificultades de aprendizaje encontró puntuaciones más altas en las medidas de depresión que sus compañeros sin dificultades de aprendizaje, lo que era cierto independientemente de quién informara de los síntomas relacionados con la depresión (es decir, autoinforme, padres o profesores). De forma similar, algunos estudios recientes de revisión sistemática y metaanálisis (Francis et al., 2019; Vieira et al., 2024) hallaron que los malos lectores tenían un mayor riesgo de experimentar ansiedad y depresión que los alumnos normolectores, con tamaños del efecto de moderados a grandes. En relación con la sintomatología depresiva, algunos estudios (Carroll et al., 2005; Mammarella et al., 2016; Li et al., 2024) han encontrado fuertes vínculos entre la dificultad lectora grave y persistente y un mayor riesgo de estado de ánimo depresivo. Sin embargo, otros estudios (Arnold et al., 2005; Grills et al., 2014; Maag y Reid, 2006; Miller et al., 2005) han mostrado resultados discrepantes, posiblemente debido a inconsistencias y heterogeneidad entre los estudios [Nelson y Harwood, 2011a, b; Mugnaini et al., 2009]. La falta de diferencias significativas entre la dislexia y los controles podría atribuirse a la edad de los participantes incluidos en los estudios. En línea con esto, una revisión de

estudios (Avenevoli et al., 2008) encontró un aumento de la sintomatología emocional con el aumento de la edad en los participantes con dislexia. Así, los adolescentes con dislexia presentaban un mayor nivel de ansiedad autopercebida, depresión y síntomas somáticos mientras que en la infancia no aparecían diferencias significativas entre disléxicos y controles (Giovagnoli et al., 2020).

Por otro lado, muchos estudios han informado de un aumento de los problemas de externalización, como las conductas antisociales y agresivas, entre los malos lectores (Halonen et al., 2006; McIntosh et al., 2012; Morgan et al., 2008; Swanson y Vaughn, 2016; Wilcutt y Pennington, 2000; Zuppardo et al., 2023). Las conductas externalizadoras y de retraimiento pueden distraer a los niños de la instrucción y de las actividades del aula, interfiriendo en su capacidad de aprendizaje, lo que conduce a un retraso en la adquisición de la lectura y a un bajo rendimiento (Lim y Kim, 2011).

Diferentes estudios (Heiervang et al., 2001; Knivsberg et al., 2008; Dahle y Knivsberg, 2014) han confirmado que los alumnos con dislexia experimentaban significativamente más problemas de interiorización, exteriorización, atención y conducta según las valoraciones de profesores, padres, e incluso de los propios participantes. Muchos de estos problemas se encontraban incluso por encima del punto de corte clínico (Dahle y Knivsberg, 2014).

1.3.- El contexto familiar de los alumnos con dislexia.

La paternidad es una experiencia enriquecedora, tanto social como psicológicamente, y es fundamental en la socialización de los hijos (García et al., 2018, 2020). Sin embargo, desde el nacimiento de su hijo, los padres experimentan una serie de estresores relacionados con la transición a la paternidad, ya que perciben que las demandas de la crianza exceden sus recursos físicos, económicos y emocionales disponibles para

gestionar o satisfacer estas demandas (Deater-Deckard, 1998). Los padres tienen que enfrentarse a nuevos retos y asumir muchas responsabilidades para criar a sus hijos y convertirlos en individuos competentes y funcionales en la sociedad, utilizando estrategias disciplinarias parentales proactivas o reactivas (Landsford, 2019). Por lo tanto, cuando los padres no pueden hacer frente adecuadamente a estas nuevas demandas de crianza por diversas razones, como sus propias características, factores sociodemográficos o las características de sus hijos, pueden desarrollar estrés parental (Abidin, 1995; Bonifacci et al., 2016). Existen pruebas de que el estrés parental se asocia a menudo con una disciplina parental disfuncional caracterizada por la crítica, la hostilidad y la baja calidez emocional, lo que, a su vez, influye en el desarrollo y mantenimiento de problemas de conducta en los niños (Bonifacci et al., 2016; Arnold et al., 2005; Sandoval-Obando et al., 2022). Además, criar a un niño con un trastorno del neurodesarrollo (es decir, dislexia, trastorno por déficit de atención con hiperactividad) puede ser más estresante que criar a niños con un desarrollo típico, desencadenando emociones intensas y problemáticas que influyen y modulan la relación de los padres con sus hijos (Auriemma et al., 2021; Dyson, 2010; Finardi et al., 2022; Fernández-Alcantara et al., 2017).

Las dificultades específicas de aprendizaje como la dislexia, en comparación con otros trastornos del neurodesarrollo, constituyen un problema invisible y aparentemente benigno que no se diagnostica hasta que el niño experimenta dificultades en la escuela que no están presentes en un niño con inteligencia normal cuyos déficits cognitivos están ocultos (Dyson, 2010). Esta apariencia de normalidad puede generar falsas esperanzas y expectativas poco realistas en los padres sobre el rendimiento académico de sus hijos, lo que a su vez podría aumentar el estrés y los problemas familiares, como señala Dyson (2010). De hecho, los resultados de la mayoría de las investigaciones sobre el estrés

parental y el funcionamiento familiar han sugerido una relación significativa entre las dificultades específicas de aprendizaje y un clima familiar problemático, que aumenta los retos y las necesidades de la vida diaria, especialmente en relación con el rendimiento académico y los problemas escolares (Anthony et al., 2024; Bonifacci et al., 2014; Delany, 1017; Dyson, 2010). Aunque los estudios sobre el estrés de los padres de niños con dislexia son escasos, los resultados son bastante consistentes, encontrando mayores niveles de estrés parental en diferentes escalas como la angustia parental y la interacción disfuncional padres-hijos, e incluso la percepción de que su hijo con dislexia es más difícil de educar (Anthony et al., 2024; Auriemma et al., 2021; Fernández-Alcantara et al., 2017).

Concretamente, según el estudio realizado por Bonifacci et al. (2014) utilizando el Índice de Estrés Parental (PSI), las madres de niños con dislexia en la escuela primaria (9-13 años) muestran mayores niveles de estrés, especialmente en las interacciones padres-hijos, y refieren mayores dificultades en la vida diaria relacionadas con las necesidades de su hijo con dislexia. Snowling et al. (2007) observaron que aproximadamente el 74% de los padres de niños en la adolescencia temprana (12-13 años) con antecedentes familiares de dislexia informaban de que las dificultades de su hijo tenían un impacto de leve a grave en la vida familiar, y que las madres de niños con dislexia presentaban mayores niveles de estrés. De forma similar, Carotenuto et al. (2017), utilizando también el Índice de Estrés Parental (PSI), descubrieron que las madres de niños con dislexia de primaria (8-11 años) presentaban mayores índices de estrés y dificultad parental en todas las subescalas del PSI. Es decir, encontraron niveles más altos de angustia parental, Interacción Disfuncional Padre-Hijo y la escala «Niño Difícil» (que mide las percepciones de los padres sobre el comportamiento del niño con respecto a

conductas que tienden a facilitar o dificultar la crianza). Sin embargo, no conocemos ningún estudio que haya analizado los estilos de crianza de los padres de niños y adolescentes con dislexia.

En síntesis, las investigaciones han demostrado que los padres de niños y adolescentes diagnosticados de dislexia presentaban un mayor estrés parental y, por lo tanto, posiblemente sean propensos a emplear estrategias educativas más disfuncionales con sus hijos debido a las dificultades académicas que suelen experimentar los alumnos con dislexia.

1.4.- Incidencia del confinamiento sobre los problemas internalizantes y externalizantes de los alumnos con dislexia y sobre sus familias.

El cierre de escuelas -y, por tanto, el aprendizaje a distancia- restringe la movilidad y el aislamiento social de los alumnos, y este conjunto de circunstancias plantea importantes retos para el bienestar psicológico de los niños y sus familias (Cachón-Zagalaz et al., 2020). En relación con el impacto que la cuarentena tenía sobre la salud mental de niños, y adolescentes muchos estudios han empleado escalas de estimación para los padres. Por ejemplo, con una muestra de España, Erades y Morales (2020) descubrieron que el 70% de los padres informaron de que sus hijos habían tenido al menos una reacción emocional negativa durante la pandemia (por ejemplo, se informó de que el 31% tenía problemas de sueño y el 24% problemas de comportamiento). Gómez-Becerra et al. (2020) indicaron que las mayores dificultades psicológicas de los niños y adolescentes españoles parecen estar relacionadas con síntomas emocionales, problemas de comportamiento y dificultades generales. También informaron de que a medida que la cuarentena se prolonga en el tiempo, la presencia de dificultades psicológicas suele aumentar. En un estudio de Orgiles et al. (2020), el 86% de los padres españoles

percibieron cambios en el estado emocional y el comportamiento de sus hijos durante la cuarentena (por ejemplo, el 77% tuvo dificultades para concentrarse, el 52% experimentó aburrimiento significativo, el 39% experimentó irritabilidad, el 38% mostró inquietud y el 38% tuvo nerviosismo notable). Algunos estudios han utilizado medidas de autoinforme para niños y adolescentes. Xie et al. (2020) encontraron niveles más altos de depresión entre los participantes del estudio en China y Duan et al. (2020) encontraron que el 23% de los encuestados de China padecían síntomas depresivos... Cao et al. (2020) también informaron de niveles más altos de ansiedad generalizada en estudiantes universitarios de China (0,9% de ansiedad grave, 2,7% de ansiedad moderada y 21,3% de ansiedad leve) durante la cuarentena. Duan et al. (2020) también informaron (aunque no con porcentajes exactos) de mayores niveles de ansiedad, con diferencias de género (es decir, más ansiedad en las mujeres que en los hombres) y de edad (es decir, más ansiedad en los adolescentes que en los niños).

Además, durante el confinamiento, los padres tuvieron que lidiar con el confinamiento y tratar de equilibrar factores como la vida personal, el trabajo y la educación de los hijos puede ser una experiencia estresante (Spinelli et al., 2020). Hasta donde sabemos, el estudio de Spinelli et al. en Italia es el único informe publicado hasta la fecha que explora el efecto de COVID-19 en el estrés de los padres. Sus resultados mostraron que la COVID-19 expone a los padres de niños de 2 a 14 años a un mayor riesgo de experimentar angustia individual y diádica durante la cuarentena, lo que puede afectar a su capacidad de ser cuidadores adecuados.

1.5.- Incidencia de la Comorbilidad con el TDAH

Los adolescentes con dificultades específicas de aprendizaje no sólo parecen constituir un grupo de mayor vulnerabilidad a experimentar problemas afectivo-

motivacionales, sino que también son más vulnerables a experimentar trastornos externalizantes, que se manifiestan provocando conflictos entre el niño y otras personas, tanto en casa como en la escuela. Esta asociación entre los trastornos específicos de aprendizaje y otros trastornos en los niños y adolescentes, puede continuar hasta la edad adulta. De hecho, del meta-análisis de Kaplan et al. (2001) realizado en Canadá se desprende que el 52% de los niños con dificultades específicas de aprendizaje presentan, al menos, otro trastorno al mismo tiempo, como el TDAH, el trastorno negativista desafiante, problemas de conducta, así como problemas emocionales como mayor ansiedad y mayores síntomas depresivos. En esa línea se manifiestan los resultados del estudio de Visser et al. (2020) realizado en Alemania. En concreto, sus resultados muestran claramente que los chicos con dificultades específicas de aprendizaje experimentan tasas más altas de problemas externalizantes (TDAH: 28%; problemas de conducta: 22%) y de problemas internalizantes (ansiedad: 21%; depresión: 28%).

De hecho, los trastornos específicos del aprendizaje como la dislexia y el trastorno por déficit de atención con hiperactividad (TDAH) muestran una elevada comorbilidad (Darweesh et al., 2020; Wilcutt y Pennington, 2000). Además, los alumnos con TDAH también muestran una alta comorbilidad con problemas de aprendizaje (Miranda et al., 2005, 2013). Además, los alumnos con TDAH presentan mayores problemas de interiorización y exteriorización, según informan tanto los padres como los profesores, que sus compañeros de control, especialmente cuando el TDAH va sociado a dificultades específicas de aprendizaje (Lau et al., 2021; Miranda et al., 2008; Nelson y Liebel, 2018; Wilcutt y Pennington, 2000). En este sentido, el grupo comórbido de dislexia más TDAH conlleva un mayor riesgo de problemas de internalización y externalización que los niños con sólo dislexia (Mugnaini et al., 2009).

En concreto, los trastornos específicos del aprendizaje como la dislexia y el trastorno por déficit de atención con hiperactividad (TDAH) muestran una alta asociación, en torno al 20-40% en la excelente revisión de Hedren et al. (2018), posiblemente debido a las altas exigencias de la función ejecutiva en la lectura que suponen un gran reto para los estudiantes con TDAH (Brook y Knapp, 1996; Darweesh et al., 2020; McGrath et al., 2011; Miranda et al., 2013; Willcutt y Pennington, 2000; Willcutt et al., 2010). En concreto, Darweesh et al. (2020) encontraron una asociación del 18%, mientras que el estudio de Visser et al. (2020) apunta a una comorbilidad del 28%. La gran variedad de asociaciones entre dislexia y TDAH puede deberse a diferentes motivos, como los criterios e instrumentos diagnósticos utilizados o la transparencia del sistema ortográfico, entre otros. El TDAH se caracteriza por la presencia de síntomas elevados de inatención, impulsividad e hiperactividad, que suelen asociarse a dificultades escolares y a un aumento de los problemas en la dinámica familiar (APA, 2023).

Theule et al. (2013) llevaron a cabo un metaanálisis de 44 estudios que utilizaron principalmente el Índice de Estrés Parental (PSI). Los resultados confirman que los padres de niños menores de 12 años con TDAH experimentan niveles mucho más altos de estrés parental que los padres de familias de control, con niveles más altos de estrés en los padres de niños varones, cuando aumenta la gravedad de los síntomas y cuando existe una asociación con problemas de conducta.

Weiner et al. (2015) analizaron el estrés parental en padres de adolescentes de 13-18 años con TDAH. Sus resultados muestran que los padres de adolescentes con TDAH informaron más estrés que los padres de adolescentes sin TDAH, especialmente con respecto a las conductas desafiantes de sus hijos, así como a las restricciones de rol, los sentimientos de alienación social, los conflictos con su pareja, los sentimientos de culpa

e incompetencia y la relación con sus hijos. Además, Weinberger et al. (2018) hallaron que los niveles de estrés de los padres eran más altos en los subgrupos de hiperactividad-impulsividad y en el subgrupo de subtipo combinado de TDA/H, incluso adoptando conductas disciplinarias parentales más negativas que en el subgrupo de TDA/H inatento.

Asimismo, el estrés parental se asocia frecuentemente con prácticas disciplinarias parentales disfuncionales, que se caracterizan por un aumento de las críticas, hostilidad y baja calidez emocional y, como consecuencia, predice el desarrollo de problemas de conducta comórbidos en la adolescencia en niños con TDAH (Colomer et al., 2014; Taylor et al., 1996). En este sentido, diversos estudios que han analizado los estilos parentales de los padres de niños con TDAH han mostrado que éstos utilizan estrategias parentales disfuncionales, generalmente con una alta carga emocional. Son más autoritarios y reaccionan con mayor irritabilidad y frustración, hacen más comentarios negativos sobre la conducta y el rendimiento de sus hijos con un tono de voz más serio, y ponen límites estrictos sin dar explicaciones, especialmente ante la presencia de problemas oposicionistas (Shelton et al., 1998; Miranda et al., 2007; Woodward et al., 1998). En el estudio realizado en España por Miranda et al. (2007) en el que se compararon los estilos educativos de 114 familias de niños con TDAH (75% subtipo combinado) y 53 familias sin TDAH, los resultados confirmaron que las madres utilizan en mayor medida estrategias de disciplina severa, aunque sin un mayor uso de la permisividad o la verborrea.

Sin embargo, el estudio de Keown y Woodward (2002) sobre 33 familias con niños preescolares con TDAH (de 3 a 5 años de edad) indica que los padres emplean estrategias disciplinarias más permisivas, un afrontamiento parental menos eficiente, índices más bajos de comunicación entre padre e hijo, e interacciones madre-hijo menos sincrónicas.

Además, el subtipo con TDAH combinado plantea mayores desafíos educativos para las familias, dado que estos niños son más impulsivos, menos tolerantes a los cambios ambientales y más malhumorados, por lo que los padres se sienten menos competentes como padres, más deprimidos, menos apegados emocionalmente a sus hijos (Miranda et al., 2007) y más abrumados por la crianza, pudiendo llegar al agotamiento (Guo et al., 2024; Mikolajczak et al., 2018).

Un estudio realizado por Bonifacci et al. (2019) en el que se comparaba el estrés parental en 38 familias de niños con dislexia y 27 familias con TDAH, demostró que las familias con TDAH experimentaban niveles de estrés mucho más elevados que las familias de niños con dislexia.

En síntesis, las investigaciones han demostrado que los niños y adolescentes con dislexia y TDAH parecen constituir un grupo de mayor vulnerabilidad a experimentar problemas internalizantes y externalizantes que sus compañeros con desarrollo típico. Además, sus padres suelen presentar un mayor estrés parental y, por lo tanto, son más propensos a emplear estrategias educativas más disfuncionales. Por lo tanto, dado que la dislexia y el TDAH tienden a coocurrir con frecuencia, los niños y adolescentes del grupo comórbido (dislexia+TDAH) podría constituir un subgrupo de mayor vulnerabilidad. De esta forma, podrían tener mayor riesgo de problemas externalizantes e internalizantes, incluso más que sus compañeros con dislexia sin TDAH. En la misma línea, los padres de niños y adolescentes con ambos trastornos (Dislexia + TDAH) podrían experimentar un mayor riesgo de estrés parental y estilos de crianza disfuncionales que los padres de adolescentes sólo con dislexia.

2.- PARTE EXPERIMENTAL

2.1.- Objetivos

1.- Nuestro **primer objetivo** de investigación (estudio 1) pretende analizar el funcionamiento ejecutivo de los niños y adolescentes con dislexia a partir de las estimaciones conductuales de padres y profesores. Este objetivo se materializó en dos preguntas de investigación: ¿cuáles son las percepciones de padres y profesores sobre la EF de los jóvenes con dislexia en comparación con sus compañeros con desarrollo típico? y ¿de qué manera hay acuerdos y desacuerdos entre las valoraciones de los informantes sobre el funcionamiento ejecutivo en dos contextos (es decir, el hogar y la escuela)?

2.- Nuestro **segundo objetivo** (estudios 2, 3 y 4) trata de analizar los problemas de interiorización y exteriorización en adolescentes con dislexia, así como el impacto que la dislexia puede tener sobre la familia. En el estudio 2, analizamos algunos problemas de salud mental con autoinformes para los adolescentes con dislexia, así como los problemas internalizantes y externalizantes de dichos alumnos mediante el empleo de escalas de estimación comportamental para padres y profesores. En el estudio 3, analizamos el estrés parental que puede producir la presencia de un adolescente con dislexia sobre las familias, así como sobre los estilos de disciplina que emplean los padres en comparación con familias con adolescentes con desarrollo típico. En el estudio 4, dado que durante la realización de esta tesis se produjo la pandemia por Covid-19 y estuvimos confinados, analizamos el impacto educativo y psicológico que el confinamiento podría tener en cuanto a la presencia de problemas de interiorización y externalización, así como sobre el contexto familiar. En concreto, sobre el estrés parental que podría producirse en el núcleo familiar.

3.- Nuestro **tercer objetivo** (estudios 2 y 3) trata de analizar el impacto que una de las comorbilidades más frecuentemente asociadas a la dislexia, el trastorno por déficit de

atención con hiperactividad (TDAH) subtipo combinado, podría tener en los adolescentes con dislexia y en sus familias. Es decir, tratamos de determinar la incidencia que podría tener la asociación de la dislexia + TDAH, subtipo combinado, en cuanto a los problemas psicológicos, internalizantes y externalizantes, así como en el núcleo familiar, frente a la dislexia sin TDAH. En el estudio 2, se comparan los problemas de salud mental, así como los problemas internalizantes y externalizantes en adolescentes con dislexia, con y sin trastorno por déficit de atención con hiperactividad, subtipo combinado. En el estudio 3, se analiza el impacto que la presencia de dislexia + TDAH podría tener sobre el estrés parental y los estilos de crianza de los padres con hijos adolescentes con dislexia, con y sin TDAH, subtipo combinado.

2.2.- Participantes

Para alcanzar nuestros objetivos participaron niños, adolescentes, y sus respectivas familias, de entre 9 y 15 años, escolarizados en centros de la Comunidad Valenciana (España). Asimismo, también participaron sus profesores tutores. Todos los participantes eran caucásicos y hablaban español como lengua materna. Así participaron tres grupos de niños y adolescentes:

Grupo Dificultades Lectoras (Dislexia). Participaron los niños y adolescentes, así como sus familias y profesores. Para el diagnóstico de las dificultades lectoras se utilizaron los criterios del DSM-5 (APA, 2014) o del DSM-5-TR (APA, 2023) para los trastornos específicos del aprendizaje: a) una puntuación de rendimiento en lectura igual o inferior al percentil 25 en precisión y/o velocidad de palabras y/o pseudopalabras de una Batería Estandarizada de Habilidades de Lectura (PROLEC-R, Cuetos et al. , 2002; PROLEC-SE-R, Cuetos et al., 2016); b) puntuaciones iguales o superiores a 80 en un test de inteligencia

no verbal (Catell, Catell y Weiss, 2017); y b) criterios de exclusión (es decir, ausencia de evidencia o historia de daño neurológico, deficiencias auditivas o visuales,...).

Grupo de Dificultades lectoras + Trastorno por Déficit de Atención e Hiperactividad.

Participaron los adolescentes, así como sus familias y profesores. Los adolescentes cumplían los criterios para el trastorno específico del aprendizaje, especificados anteriormente para el grupo de dificultades lectoras, como los criterios de TDAH subtipo combinado. Todos los adolescentes tenían un diagnóstico previo de TDAH subtipo combinado, por parte de los servicios de salud mental que fue confirmado antes de su participación en este estudio de acuerdo con los criterios diagnósticos del DSM-5 (APA, 2014) o del DSM-5-TR (APA, 2023). Así, todos ellos presentaban los siguientes criterios: seis o más síntomas de falta de atención y seis o más síntomas de hiperactividad-impulsividad según las evaluaciones de padres y profesores; persistencia de los síntomas durante más de 6 meses; e inicio de los síntomas antes de los 12 años. Además, los síntomas del TDAH interferirían en el funcionamiento académico y/o social diario del sujeto. Los criterios de exclusión aplicados incluían tener un CI inferior a 80, autismo, psicosis, epilepsia o cualquier otra enfermedad neurológica o genética.

Grupos control con desarrollo típico. Todos niños y adolescentes del grupo de control con desarrollo típico asistían a aulas ordinarias y no recibían servicios educativos adicionales ni dentro ni fuera del aula ordinaria. Todos los participantes de este grupo cumplían los siguientes criterios: (a) rendimiento académico medio o superior en todas las áreas según un informe del profesor; (b) puntuaciones de 80 o más en inteligencia (Catell, Catell y Weiss, 2017); (c) una puntuación de rendimiento en lectura igual o superior al percentil 50 en las subpruebas de habilidades de lectura de palabras y pseudopalabras de una Bateria

Estandarizada de Habilidades de Lectura Lectura (PROLEC-R, Cuetos et al. , 2002; PROLEC-SE-R, Cuetos, Arribas y Ramos, 2016).

La descripción específica de los participantes se encuentra en los diferentes artículos que componen esta tesis.

2.3.- Medidas

Cuestionario de información demográfica. Los padres facilitaron información sociodemográfica sobre su familia, número de hijos, sexo, nivel educativo, ocupación (basada en la Clasificación Internacional Uniforme de Ocupaciones, 2012) y estado civil. También respondieron a preguntas sobre la escolarización pasada y presente de sus hijos.

Inteligencia. Se empleó el Test de Inteligencia Factor «g» (Cattell, Cattell y Weiss, 2017) que mide la capacidad mental general sin la interferencia de estímulos verbales. La prueba requiere la búsqueda de relaciones entre formas y figuras abstractas. La fiabilidad de la adaptación española de este test de inteligencia es de .86.

Rendimiento en lectura. Las habilidades de lectura de palabras y pseudopalabras se midieron con una Batería Estandarizada de Habilidades de Lectura (PROLEC-R, Cuetos et al. 2002; PROLEC-SE-R, Cuetos et al., 2016). La lectura de palabras requiere la identificación correcta de 40 / 96 palabras que varían mucho en frecuencia, longitud y estructura ortográfica (CCV, CVV, CVC, CCVC, CVVC y VC, donde C= consonante y V= vocal), y la lectura de pseudopalabras consiste en pronunciar 40 / 48 pseudopalabras. En la lectura de palabras y pseudopalabras, se cronometra la finalización de la tarea. Se obtienen dos puntuaciones combinadas de fluidez, una basada en la fluidez de lectura de palabras y la otra en la fluidez de lectura de pseudopalabras. En ambos casos, la puntuación del participante consiste en una puntuación de precisión dividida por la velocidad de

lectura, medida como el tiempo que tarda en completar la tarea, y luego multiplicada por 100. Estas baterías de lectura ha demostrado tener una consistencia interna adecuada.

Funciones Ejecutivas. Se utilizó la versión española del Inventario de valoración de conductas de la función ejecutiva BRIEF-2 (Gioia et al., 2017), que cumplimentan los padres o profesores para reflejar la frecuencia con la que un niño de entre 5 y 18 años muestra conductas específicas. Los formularios de padres y profesores contienen 63 ítems cada uno que dan lugar a nueve escalas clínicas no superpuestas pero correlacionadas. Marcando con un círculo «nunca», «a veces» o «a menudo», los evaluadores indican si el niño ha experimentado problemas durante los últimos 6 meses con una conducta determinada descrita en un ítem concreto. El BRIEF-2 también proporciona tres índices resumen: el índice de regulación conductual, el índice de regulación emocional y el índice de regulación cognitiva. El índice de regulación conductual está compuesto por dos subescalas: (a) inhibición (8 ítems), que mide la capacidad de controlar los impulsos, y (b) automonitorización (4 ítems), que mide la capacidad de hacer un seguimiento del efecto de la propia conducta en los demás. El índice de regulación emocional está compuesto por 2 subescalas: (a) cambio (8 ítems), que mide la capacidad de transferir entre tareas y mentalidades, y (b) control emocional (8 ítems), que mide la capacidad de modular las respuestas emocionales. El índice de regulación cognitiva está compuesto por 5 subescalas: (a) iniciación (5 ítems), que mide la capacidad de comenzar una tarea o actividad de forma independiente, (b) memoria de trabajo (8 ítems), que mide la capacidad de retener información relevante en la mente con el fin de completar una tarea, (c) planificación-organización (8 ítems), que mide la capacidad de planificar con antelación y organizarse para eventos y objetivos futuros, (d) supervisión de tareas (5 ítems), que mide la capacidad de comprobar el trabajo y evaluar el rendimiento durante o después de terminar una tarea para garantizar la consecución del objetivo, y (e) organización de materiales (6 ítems), que

mide la capacidad de mantener organizados el espacio de trabajo y los materiales. Entre estos tres y las nueve subescalas que se acaban de enumerar, se obtiene una puntuación global. En todas las escalas, las puntuaciones más altas indican más dificultades en esa área. El BRIEF-2 proporciona puntuaciones T en todas las escalas e índices y su fiabilidad y validez han sido ampliamente demostradas (Gioia et al., 2017). En la versión española, los alfas de Cronbach oscilan entre .81 y .94 para la versión de padres y entre .86 y .95 para la versión de profesores, en todas las edades. En la muestra actual, los alfa de Cronbach oscilaron entre .80 y .91 para la versión de padres y entre .83 y .94 para la versión de profesores.

Ansiedad. Los adolescentes completaron la adaptación española del State-Trait Anxiety (STAIC; Spielberger, 2014). El STAIC distingue entre una propensión general comportamiento ansioso arraigado en la personalidad (subescala de ansiedad rasgo) y la ansiedad como un estado emocional (subescala de ansiedad de estado). Cada subescala incluye 20 ítems de tipo Likert, que puntúan en una escala de 3 puntos que va de 1 (casi nunca) a 3 (casi siempre). El alfa de Cronbach es superior a 0,90. En el estudio 4, se empleó exclusivamente la subescala de ansiedad estado.

Depresión. El Inventario de Depresión Infantil (CDI; Kovacs, 2004) está compuesto por 27 ítems que evalúan la sintomatología depresiva. El CDI evalúa dos escalas: disforia (estado de ánimo depresivo, tristeza, preocupación, etc.) y autoestima negativa (juicios de ineficacia, fealdad, mezquindad, etc.) y proporciona una puntuación total de depresión. Cada uno de los ítems tiene tres opciones de respuesta que puntúan 0 (sin sintomatología), 1 (sintomatología leve) o 2 (sintomatología grave). La mitad de los ítems comienzan con la opción que refleja la mayor gravedad del síntoma, y en el resto se invierte la secuencia de presentación. La puntuación se obtiene sumando cada uno de los valores atribuidos

según la opción de respuesta del niño; por tanto, a mayor puntuación, mayor intensidad de la sintomatología depresiva presentada, pudiéndose obtener una puntuación máxima de 54. Una puntuación de 19 en la escala total representa el percentil 90 (un punto de corte frecuente para el cribado de muestras deprimidas), y la escala suele tener un coeficiente alfa superior a 0,80. En el estudio 4, se empleó el Children's Depression Inventory-Short Form (CDI-S; Kovacs, 1992), que es una herramienta de autoevaluación de 10 ítems del CDI anterior. Los niños marcan una de las tres afirmaciones que mejor describen sus sentimientos en las últimas dos semanas. Los enunciados de los ítems indican la gravedad de la sintomatología depresiva y están dispuestos en orden creciente o decreciente. Las puntuaciones totales oscilan entre 0 y 20, mientras que las puntuaciones sumadas altas indican una sintomatología más grave. La adaptación española de este inventario para niños, de 9 a 15 años, tiene una fiabilidad adecuada con un alfa de Cronbach de .71 (Del Barrio et al., 2002). En la muestra actual, el alfa de Cronbach fue de .69.

Problemas internalizantes y externalizantes. Padres y profesores completaron la versión española del Cuestionario de Fortalezas y Dificultades (SDQ; Goodman, 2001; Ortuño-Sierra et al., 2017), que está diseñado para recopilar información sobre las dificultades emocionales y conductuales que experimentan los niños de 4 a 17 años. El SDQ consulta los atributos positivos y negativos mostrados por los adolescentes en los últimos 6 meses a través de cinco subescalas: síntomas emocionales (por ejemplo, a menudo se siente infeliz, decaído), problemas de conducta (por ejemplo, a menudo tiene rabietas o mal genio) e hiperactividad-inatención (por ejemplo, inquieto, hiperactivo, no puede permanecer quieto durante mucho tiempo), problemas de relación con los compañeros (por ejemplo, tiende a jugar solo) y comportamiento prosocial (por ejemplo, considerado con los sentimientos de los demás). Cada subescala se mide mediante 5 ítems, valorados en una escala de 3 puntos que va de 0 (totalmente en desacuerdo) a 2 (totalmente de acuerdo). Para

obtener las puntuaciones totales, se suman los ítems. Se utilizaron los datos normativos de Español-Martín et al. (2020) que fijan en el percentil 90 el rango de corte clínico. La prueba ha demostrado tener validez de criterio y buena fiabilidad test-retest a los cuatro y seis meses (media = 0.62). Además, la consistencia interna es satisfactoria, con un alfa de Cronbach que oscila entre .57 y .88 (Goodman, 2001). La adaptación española de Ortuño-Sierra et al. (2017) mostró una consistencia interna para la puntuación de dificultades totales de .84, oscilando entre .75 y .78 para las subescalas del SDQ. En la muestra actual, el alfa de Cronbach fue de .96 para problemas emocionales, .92 para problemas de conducta y .82 para hiperactividad-inatención. En el estudio 4 se emplearon específicamente las siguientes subescalas del cuestionario para padres: síntomas emocionales, problemas de conducta e hiperactividad-inatención.

Estrés Parental. Se utilizó el Parenting Stress Index-Short Form (PSI-SF) para evaluar las características de la crianza y de la familia, con el objetivo de identificar posibles problemas de conducta de los padres y dificultades de adaptación del niño dentro del sistema familiar (Abidin, 1995). En este estudio, se utilizó el PSI-SF español (Díaz-Herrero et al., 2010, 2011). El PSI-SF incluye 36 ítems y arroja una Puntuación Total de Estrés a partir de tres escalas (12 ítems por escala): Angustia Parental (PD), Interacción Disfuncional Padres-Hijos (PCDI) y Niño Difícil (DC). Cada ítem se puntúa en una escala Likert de cinco puntos, de 1 (totalmente en desacuerdo) a 5 (totalmente de acuerdo), indicando las puntuaciones más altas mayores niveles de estrés parental. El dominio PD mide la angustia experimentada por los padres debido a factores personales, como la depresión o el conflicto con la pareja, o la restricción de la vida debido a las exigencias de la crianza de los hijos en su papel de padres. El dominio PCDI se centra en la percepción de que el niño no responde a las expectativas de los padres. La subescala DC representa los

comportamientos que suelen tener los hijos y que pueden facilitar o dificultar la crianza. La escala también proporciona una medida del estrés total sumando las puntuaciones de los 36 ítems totales. La PSI-SF muestra una elevada consistencia interna (alfa de Cronbach): 0,84 (PCDI), .82 (PD /DC), y 0,90 para el Estrés Total. En la muestra actual, el alfa de Cronbach fue de 0,70 para DP, 0,80 para PCDI, 0,73 para DC y 0,86 para estrés total.

En el caso del **estudio 4**, se emplearon además los siguientes instrumentos:

Motivación Lectora. Los niños respondieron al Perfil de Motivación para la Lectura revisado (MRP; Malloy et al., 2013). La encuesta de 20 preguntas evalúa dos dimensiones específicas de la motivación para la lectura: el autoconcepto como lector y el valor de la lectura. Los ítems que se centran en el autoconcepto como lector están diseñados para obtener información sobre la competencia autopercebida de los estudiantes en la lectura y su percepción de sí mismos en relación con sus compañeros. Los ítems sobre el valor de la lectura obtienen información sobre el valor que los alumnos conceden a las tareas de lectura, especialmente en términos de frecuencia de lectura y de actividades relacionadas con la lectura. Los alumnos responden a los ítems utilizando una escala Likert de 1-4, en la que 4 representa la respuesta más positiva. El alfa de Cronbach reveló una fiabilidad moderadamente alta para ambas subescalas (autoconcepto = .81; valor = .87) y para la escala completa .87 (Malloy et al., 2013). En la muestra actual, el alfa de Cronbach fue de .87, .95 y .97, para el autoconcepto, el valor y la escala total, respectivamente.

Motivación hacia las tareas. La motivación de los niños hacia las tareas se midió utilizando la Escala de Tareas y Valores para Niños (TVS-C; Aunola et al., 2006; Nurmi y Aunola, 2005). Esta escala mide la motivación por las tareas de los niños en el colegio

y en casa. En el presente estudio, utilizamos los tres ítems que miden el valor intrínseco de los niños hacia la lectura (por ejemplo, «¿Cuánto te gusta hacer tareas relacionadas con la lectura en casa?». Cada ítem se puntuó en una escala Likert de 5 puntos (1 = no me gusta nada/no me gusta hacer esas tareas; 5 = me gusta mucho/disfruto mucho haciendo esas tareas). Se creó una puntuación total para el valor intrínseco relacionado con la asignatura calculando la media de las tres puntuaciones de los tres ítems. El alfa de Cronbach es de 0,88 (Aunola et al., 2006). En la muestra actual, el alfa de Cronbach fue de 0,84.

Inventario de actividades de lectura. Se utilizó el Inventario de Actividad Lectora (RAI) para medir la amplitud (géneros leídos) y la frecuencia (con qué frecuencia se leía un género) de la lectura de los alumnos (Guthrie, McGough y Wigfield, 1994). En este estudio se utilizó la versión abreviada de 10 ítems de Wigfield & Guthrie (1997). Se pidió a los niños que respondieran a cinco preguntas sobre lo que leían (libros de misterio, libros de deportes, libros de aventuras, cómics/revistas y libros de naturaleza) y con qué frecuencia leían para divertirse. Si el niño indicaba que había leído un determinado tipo de libro en la última semana, se le pedía que indicara su título. A continuación, se pide al niño que indique con qué frecuencia lee ese tipo de libro, respondiendo en una escala de 1 a 4 desde casi nunca hasta casi todos los días. Aunque no existe una fiabilidad tradicional para esta medida, las administraciones de otoño y primavera de la medida correlacionaron .54 ($p < .001$), lo que sugiere un nivel sustancial de estabilidad en la medida (Wigfield & Guthrie, 1997). En la muestra actual, el alfa de Cronbach fue de 0,84 para la amplitud y de 0,70 para la frecuencia de lectura.

Salud Mental. Se midió la salud mental de los padres mediante el Cuestionario de Salud General (GHQ-12; Goldberg et al., 1997) de 12 ítems, que es una herramienta de

autoevaluación. La versión española de este cuestionario tiene buenas propiedades psicométricas y el coeficiente alfa de Cronbach fue de .86 para personas de ≤ 65 años y de .90 para ≥ 65 años (Rocha et al., 2011). El cuestionario incluye opciones de respuesta que van de 0 (nunca) a 3 (habitualmente). Las puntuaciones totales oscilan entre 0 y 36, indicando las puntuaciones más altas un mayor grado de alteración del estado de salud general. Una puntuación total superior a 12 puntos (puntuación percentil >75) indica una «tendencia a los problemas psicológicos». En la muestra actual, el alfa de Cronbach fue de .75.

Cuestionario sobre las condiciones educativas de los niños durante la cuarentena. Se elaboró un cuestionario de 16 ítems para padres sobre el aprendizaje a distancia, el tiempo dedicado al aprendizaje, las dificultades en los deberes, la ayuda de los profesores y algunas preocupaciones educativas de los padres durante la cuarentena nacional.

2.4.- Procedimiento

El estudio respetó todos los principios recogidos en la legislación vigente sobre la investigación clínica y fue aprobado por el Comité de Ética de la Investigación de la Universitat de València (código de protocolo H1518525013984 y fecha de aprobación 2 de marzo de 2018), que se rige por los Principios Éticos para las Investigaciones Médicas en Seres Humanos (Declaración de Helsinki, 1964; Asociación Médica Mundial, 2013). Así, se obtuvo el permiso verbal de los niños y el consentimiento informado de los padres antes de iniciar cualquier procedimiento del estudio.

La captación de participantes para este estudio se produjo (a) contactando con asociaciones de padres relevantes (por ejemplo, asociaciones de padres de niños con dislexia y de TDAH) y compartiendo la información de participación en el estudio con los miembros, y (b) contactando con psicólogos escolares de diferentes colegios de toda la

región para compartir la misma información de participación en el estudio y pidiéndoles que compartieran la información con las familias de los niños que asistían al colegio. Para los participantes en los grupos con dislexia y TDAH, los psicólogos escolares pidieron a los profesores que recomendaran a niños de sus aulas que tuvieran un bajo rendimiento en lectura y/o diagnóstico o sospechas de TDAH. A partir de esa lista, los psicólogos informaron a las familias de esos niños sobre el estudio. Los participantes del grupo de control se reclutaron en las mismas escuelas que los participantes de los grupos clínicos (dislexia y TDAH). En primer lugar, los psicólogos escolares proporcionaron información general sobre el estudio a las familias de los niños que asistían a las escuelas participantes, indicándoles que para participar era necesario que los niños tuvieran un rendimiento académico medio o superior a la media. A todos los padres y niños que mostraron interés en participar en la investigación, el equipo de investigación les proporcionó información más detallada sobre la participación en el estudio.

Tras recibir el consentimiento correspondiente, un psicólogo administró la batería de pruebas mencionadas anteriormente de acuerdo con los protocolos estandarizados respectivos. Estas medidas se administraron en orden aleatorio y en una sala libre de ruidos y distracciones. La duración de las sesiones de evaluación varió en función del participante evaluado. Los niños y adolescentes recibieron un obsequio (por ejemplo, bolígrafos, lápices de colores, estuches, memoria USB) por participar.

El procedimiento seguido en el caso del estudio 4 fue un tanto diferente dado que se realizó con aquellos niños que habían sido evaluados justo antes del confinamiento, a finales del 2019 y principios del 2020. Durante el confinamiento las evaluaciones se realizaron en mayo de 2020, a 1,5 meses (es decir, 45-47 días) después del inicio de la cuarentena nacional en España, en dos o tres sesiones mediante entrevistas telefónicas o

por videoconferencia (con Blackboard Collaborate) con los niños y sus padres. A los padres participantes que tenían varios hijos en el hogar se les pidió específicamente que respondieran a todas las preguntas y encuestas para el niño específico participante en el estudio.

2.5.- Resultados

2.5.1.- Estudio 1

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Abstract

Research exploring behavioral ratings of executive functioning (EF) for children and adolescents with dyslexia is scarce, which limits researchers, clinicians, educators, and parents from understanding and best supporting these students at home and/or school. Using the *Behavior Rating Inventory of Executive Function, Second Edition* (BRIEF-2) rating scale to measure participants' EF behaviors in home and school settings, a primary objective of this study was to examine the EF of Spanish children and adolescents with dyslexia ($n = 78$) and to compare their EF with typically developing (TD) peers ($n = 82$). The study also sought to examine agreements and disagreements among teacher and parent raters. One key finding was that children and adolescents with dyslexia were rated by both parents and teachers as having more frequent cognitive, behavioral, and emotional EF difficulties in home and school compared with TD peers. However, teachers often reported greater severity of impairments than parents did across several EF domains, potentially suggesting a differential pattern of EF difficulties between home and school. Results are discussed in relation to multi-informant assessment practices for EF behaviors (e.g., there may be differential patterns of EF difficulties between home and school) and how the findings have implications for supporting children and adolescents with dyslexia.

Keywords

BRIEF-2, cognitive regulation, dyslexia, executive functioning, parents, teachers

Dyslexia is a specific reading disorder of neurological origin that persists throughout life despite an individual having adequate intelligence, education, and socioeconomic background to learn to read (American Psychiatric Association [APA], 2013). Individuals with dyslexia have difficulties with accurate or fluent word recognition (Shaywitz et al., 2008; Snowling & Hulme, 2012). Compared with students with average to above-average reading skills, accumulated evidence suggests that students with dyslexia can show a range of reading-related (e.g., pseudoword reading, spelling, vocabulary) and cognitive (e.g., rapid naming, verbal, working memory) difficulties (Kudo et al., 2015; Vellutino et al., 2004).

In recent years, a growing body of evidence suggests that children and adolescents with dyslexia may also manifest difficulties with executive functioning (EF). Although there is no universally agreed-upon definition of EF, most conceptualizations include several related but separate skills associated with purposeful, goal-oriented, problem-solving behaviors that support cognitive, emotional, and behavioral regulation (Castellanos et al., 2018; Hofmann et al., 2012; Lezak et al., 2004). Several models of EF have been proposed, and there has been some debate about

specific definitions and subcomponents of EF constructs (Burguess et al., 1998; Zelazo et al., 2016). The present study utilizes the model of EF proposed by Gioia et al. (2000, 2015), which attempts to incorporate the emotional, behavioral, and cognitive skills that are broadly described as executive abilities.

The first version of this model attempted to obtain more detailed information about EF subprocesses. Using the BRIEF, the original model included eight scales that clustered together in a behavioral regulation and a meta-cognitive factor (Gioia et al., 2000). However, a later reorganization of the model into nine subscales found evidence of three underlying EF factors or domains: a cognitive regulation factor, a behavioral regulation factor, and an emotional regulation factor (Gioia et al., 2002a). Importantly, this revision and reorganization of

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the BRIEF contained no new items, which allowed for direct comparison of scores between versions. In the Gioia et al. (2002a) study, the item content of the Monitor scale was re-examined and hypothesized to reflect two distinct dimensions (i.e., one's ability to monitor task-related activities or monitor personal activities) that were associated differently with the cognitive regulation and behavioral regulation factors, respectively. Multiple subsequent studies using exploratory and/or confirmatory factor analysis (Byerley & Donders, 2013; Egeland & Fallmyr, 2010; Gioia et al., 2015; Peters et al., 2012) supported the multidimensional view of Gioia and colleagues' (2002a) model of EF as well as the cognitive, behavioral, and emotional domains.

General characteristics of the three domains described within this model are as follows. The cognitive domain of EF refers to the degree of difficulty a person has in trying to control or manage their cognitive processes and problem solving effectively. This cognitive domain includes processes such as identifying and planning to reach future goals, initiating efforts to implement plans, monitoring progress toward goal achievement, and utilizing working memory. The behavioral domain of EF refers to the degree of difficulty a person has when regulating and supervising their behaviors effectively; it includes the ability to inhibit behavioral responses not relevant for goal achievement and to monitor one's own behavior as well as those of others to appropriately gauge behavioral responses. The emotional domain of EF reflects the degree of difficulty a person has when regulating emotional responses, especially in response to changing situations; it includes skills related to appropriately modulating emotional responses as well as flexibility when shifting from situation to situation or from task to task.

By distinguishing these three domains of EF and measuring it with, for example, the BRIEF rating scale, this allows for clearer assessment of an individual's strengths and weaknesses in EF—and such an assessment has direct implications for developing the most relevant interventions or supports for an individual who has difficulty in one or more domains. For example, if a child with a neurodevelopmental disorder is struggling specifically with EF skills related to cognitive regulation, but the child appears to have EF skills related to behavioral and emotional regulation that are generally consistent with same-age peers, the child's parent(s)/caregiver(s), teachers, and/or psychologist can plan for intervention and follow-up observations using this knowledge about relative domain-specific strengths or challenges in EF. Ultimately, this type of “targeted” intervention, as well as follow-up observation and evaluation, is a lynchpin of any helping profession because services are provided directly to the particular areas of need. Moreover, as we will discuss in more detail later in this article, assessment of specific EF domains can also elucidate relative strengths or weaknesses in specific settings (e.g., at home

vs. in school), which also helps to understand an individual's relative strengths, needs, and setting-specific areas that could be targeted for support.

Evaluating EF for Students With Dyslexia

Although there have been different studies that have used rating scales of EF for individuals with attention-deficit hyperactivity disorder (ADHD; for example, Jacobson et al., 2016), math disabilities (Holm et al., 2018), specific language impairment (Wittke et al., 2013), reading comprehension difficulties (Locascio et al., 2010), and other neurodevelopmental disorders and psychopathologies (see Gioia et al., 2002b; Snyder et al., 2015; Wochos et al., 2014), there are only four known studies that have used a behavioral rating scale to examine EF in students with dyslexia. For instance, Gioia et al. (2002b) used the parent version of the BRIEF with 34 English-speaking children with reading disabilities and found EF deficits in cognitive regulation (i.e., working memory, planning–organization), and in behavior regulation (i.e., inhibition scales), with 62% (working memory), 47% (planning–organization), and 29% (inhibition) of these children meeting the clinical significance range on those scales.

Locascio et al. (2010) administered the parent version of the BRIEF to parents of 44 English-speaking children from 10 to 14 years old with word recognition deficits. They found that parents whose children had poor word recognition skills rated their child as having significantly lower levels of EF than children with reading comprehension problems and controls. However, only global executive composite (GEC) scores were reported in their study, and this overall summary score, collapsed across cognitive, behavioral, and emotional facets of EF, does not reveal the specific skills of EF that parents of children with dyslexia often rate as problematic. As noted previously, understanding domain-specific strengths and weaknesses has important implications for comprehensively understanding an individual's EF skills and developing targeted supports when weaknesses are significant.

Similar to findings of Gioia and colleagues (2002b), Schöfl et al. (2014) found that 17 German-speaking children with dyslexia (compared with a control group without dyslexia) were rated by parents as having more cognitive regulation difficulties with working memory and planning–organization. Most recently, Smith-Spark et al. (2016) showed that 31 English-speaking adults with dyslexia self-reported more frequent EF problems, with these difficulties centering on metacognitive processes (working memory, planning, task monitoring, and organization), rather than on the regulation of emotion and behavior. However, although statistical significance was not reached, adults with dyslexia had lower EF in terms of regulating emotion and behavior.

Overall, these earlier studies of EF in students with dyslexia show that, in a home context, parents rated children with dyslexia as having EF difficulties in different domains. Interestingly, no past studies have included schoolteachers to report on the EF of children with dyslexia. This is important because the domains of EF (i.e., cognitive, behavioral, and emotional) are distinct and its multidimensional nature indicates that specific EF difficulties may appear in singular or multiple domains across differing contexts and setting-specific demands (Goldberg & Podell, 2000). For example, home and school settings differ in cognitive demands as well as in norms for behavioral and emotional expression (Allan & Gilbert, 2002). Thus, it is necessary to evaluate EF in different contexts (e.g., home and school) to understand how those with dyslexia use EF in response to different setting-specific demands. Such an evaluation allows for a more comprehensive assessment and the ability to examine possible agreements and disagreements between informants (e.g., parents and teachers).

Evaluating Agreements and Disagreements Between Different Rating Scale Informants

Disagreements between informants are most pronounced when they observe children in different settings and when they play different roles in children's lives, such as parents and teachers (e.g., Achenbach, 2017; De Los Reyes & Kazdin, 2005). For instance, some studies showed low-to-moderate correlations across behavior rating scales (e.g., ADHD, problem behavior) taken from multiple information sources of the same symptoms (Achenbach et al., 1987; De Los Reyes et al., 2015; Miranda et al., 2008). However, not all studies fit this pattern. For example, using the BRIEF, Gioia et al. (2015, 2017) found moderate and high correlations for a normative sample. Inconsistent results across studies might come from the use of different types of questionnaires across studies and/or from the inclusion of varying age groups, who might behave in different ways within the various domains that may be assessed (e.g., internalizing behavior, behaviors associated with ADHD, EF, socio-emotional competence).

A prevailing notion in clinical assessment is that informant discrepancies (e.g., from parents and teachers) largely reflect measurement error or informant biases, but accumulated evidence does not support this as the primary or most parsimonious explanation (De Los Reyes et al., 2013). Rather, informant disagreements may reflect true situation-related variation in behavior and/or differences in raters' knowledge and experiences (Achenbach, 2011, 2017; De Los Reyes & Kazdin, 2004, 2005). For example, parents may base their ratings on how their children behave at home and respond to common home-based directives, such as "go

to bed," "clean your room," or "complete your chores." Teachers base their ratings on how the child behaves at school and responds to school-based responsibilities (e.g., interacting with peers in class, staying on-task during classroom instruction). In addition, parents likely base their ratings on a very limited set of experiences between themselves and their child(ren), whereas teachers may frequently interact with 20 or more students each year and thus have relatively limited time with any one child as well as a broader set of age-specific comparisons. It is also more likely that teachers' ratings will be based on a relatively more structured setting (De Los Reyes et al., 2009). These situational variations may result in disagreements between parent and teacher ratings. Cross-informant disagreement (CID) therefore represents, in part, true variation among children in how their behavior is bound to a given context (e.g., home and school). Thus, disagreements across informants' ratings of children's behavior in different contexts likely represent not only variation but also a meaningful heterogeneity in clinical patterns.

Purpose of the Present Study and Research Questions

Although a small number of prior studies have sought to measure EF in children and adolescents with dyslexia, this research base is still quite limited. For instance, no prior studies using rating scales of EF in youth with dyslexia have used multiple informants (e.g., parents and teachers), yet the assessment of multiple informants is critical because EF skills are required in multiple contexts, such as being able to inhibit inappropriate behavior or remember a sequence of tasks (Reynolds & Horton, 2008; Zelazo et al., 2016). In addition, only two past studies compared domains of EF ratings between children or adolescents with and without dyslexia—and both of those studies had a relatively small sample of participants with dyslexia ($n = 17$ and 34).

To address these notable gaps in the existing literature and, in general, to advance an empirical understanding about EF for children and adolescents with dyslexia, our study had two research questions.

Research Question 1 (RQ1): What are parents' and teachers' perceptions of EF for youth with dyslexia compared with their typically developing (TD) peers?

Research Question 2 (RQ2): In what ways are there agreements and disagreements between informants' ratings of EF in two contexts (i.e., home and school)?

The "Data Analysis" section of this article explains how each research question was addressed and explains how we used three research-informed and complimentary approaches to answering RQ2.

Method

Participants

The final sample for this study included 160 Spanish-speaking children and adolescents. Participants came from 74 schools in the Valencian Community (Spain), gathered from 268 referrals to this multiyear investigation. All participants were Caucasian and spoke Spanish as their primary language. Table 1 shows the demographic characteristics of the participants. As shown, they ranged from 9 to 15 years old (M age = 10 years, 8 months; SD = 1 year, 4 months), with 88 males and 72 females representing two separate groups for the purpose of this study: (a) the dyslexia group (DG), consisting of 78 students with dyslexia (M age=11 years, 1 month; 40 males and 38 females), and (b) the TD control group, consisting of 82 students (M age = 10 years, 8 months; 48 males and 34 females) who did not present with characteristics associated with dyslexia.

Preliminary selection of potentially eligible participants was consistent with several past studies (e.g., Begeny et al., 2011; Pereira-Laird et al., 1999; Soriano-Ferrer et al., 2011; Soriano-Ferrer & Miranda, 2010), such that potential DG participants in the present study were recommended by teachers based on students' low reading achievement in the classroom. The actual presence of dyslexia for DG participants was then determined by using the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5*; APA, 2013) criteria specified for identifying students with a specific learning disability: (a) scores of 80 or above on an intelligence test (Cattell & Cattell, 2006), to exclude students with cognitive impairments; (b) no evidence or history of neurological damage, significant economic disadvantage, emotional disturbance, hearing or vision abnormalities, or any other major handicapping condition; and (c) a reading achievement score at or below the 25th percentile on the word-reading and/or pseudoword-reading skill subtests from the *Standardized Reading Skills Battery* (PROLEC-R, Cuetos et al., 2002; PROLEC-SE, Ramos & Cuetos, 2003). Thirty-eight children and adolescents with dyslexia (48.7%) attended special education classes (i.e., resource rooms) 3 hr per week in their respective schools, as stipulated in the current regulations in Spain for students with learning disabilities. The children in the TD control group only attended regular classrooms and did not receive educational services outside of the regular classroom. All participants in the TD group met the following criteria: (a) average or better academic performance in all areas according to a teacher's report, (b) scores of 80 or above on intelligence, and (c) a reading achievement score at or above the 50th percentile on the word-reading and pseudoword-reading skill subtests from the *Standardized Reading Skills Battery*. In some cases, information on the academic and developmental history of the children was obtained from

the school's psycho-educational support services, and in other cases, this information was obtained from the student's family.

From the 268 referrals to this study, 108 students were excluded for different reasons: 65 met criteria for ADHD, 10 had an intelligence test score <80, five had a maternal language different from Spanish, and three had vision problems that had not been corrected. Finally, 25 participants (9.3% of the total sample) who would otherwise have been included in the study could not be included due to incomplete data (i.e., parent, teacher, and child assessments were not completed).

Measures

Demographic information questionnaire. Caregivers (henceforth referred to as *parents*) supplied information about their sex, level of education, occupation (based on International Labour Organization, 2012), and marital status. They also responded to items about their child's past and current schooling (e.g., number of grade retentions, whether they received homework help).

Factor "g" intelligence test (Scale 2, Form A). This test (Cattell & Cattell, 2006) measures general mental capacity without the interference of verbal stimuli. The test requires the search for relationships between abstract shapes and figures. The reliability of the Spanish adaptation of this intelligence test is .86. In the current sample, the Cronbach's alpha was .79.

Standardized Reading Skills Battery. Word and pseudoword-reading skills were measured with the *Standardized Reading Skills Battery* (PROLEC-R, Cuetos et al., 2002; PROLEC-SE, Ramos & Cuetos, 2003). Word reading requires the correct identification of 40 words that vary greatly in frequency, length, and spelling structure (CCV, CVV, CVC, CCVC, CVVC, and VC, where C = consonant and V = vowel), and pseudoword reading consists of pronouncing 40 pseudowords, constructed by changing or adding one or two letters to each of the 40 words on the reading test. In word and pseudoword reading, task completion is timed. Two combined scores of fluency are obtained, one based on word-reading fluency and the other on pseudoword-reading fluency. In both cases, the child's score consists of an accuracy score divided by the reading speed, measured as the time taken to complete the task, and then multiplied by 100. This reading battery has been found to have adequate internal consistency (Cronbach's α = .74).

BRIEF-2. We used the Spanish version of the BRIEF-2 (Gioia et al., 2017), which is completed by parents or teachers to reflect the frequency with which a child aged 5 to 18 years exhibits specific behaviors. The parent and teacher

Table 1. Descriptive Data According to Participants in the DG and the TD Group.

Variable	DG (n = 78)		TD group (n = 82)		Statistics		
	M	SD	M	SD	F(1, 158)	p	η^2
Age	11.01	1.40	10.8	1.54	n.s.	n.s.	n.s.
IQ	104.3	12.47	105.2	15.58	n.s.	n.s.	n.s.
Word-reading accuracy	34.41	4.91	39.74	0.52	95.345	.001	.37
Word-reading speed	75.87	30.26	40.73	13.95	90.558	.001	.36
Word-reading fluency	51.95	18.30	109.04	36.39	154.695	.001	.47
Pseudoword-reading accuracy	28.82	6.78	39.01	1.51	176.051	.001	.52
Pseudoword-reading speed	92.05	31.14	52.73	14.31	106.980	.001	.40
Pseudoword-reading fluency	34.93	14.25	79.58	21.78	232.853	.001	.46
	n	%	n	%	$\chi^2_{(1)}$	p	
Sex							
Female	38	48.7	34	41.5	n.s.	n.s.	
Male	40	51.3	48	58.5			
Student Academic Information							
Grade retention	8	10.2	0	0	9.344	.002	
Resource room	38	48.7	0	0	55.668	.001	
Homework help	68	87.2	38	46.3	29.829	.001	
Father's educational level							
Elementary	25	32.1	45	54.8	8.486	.01	
Medium	35	44.8	25	30.5			
High	18	23.1	12	14.6			
Mother's educational level							
Elementary	24	30.7	39	47.6	9.825	.01	
Medium	28	35.9	32	39			
High	26	33.4	11	13.4			
Father's occupation ^a							
Without a paid job	0	0	5	6.1	10.370	.05	
Skill Level 1	4	5.1	12	14.6			
Skill Level 2	56	71.8	52	64.6			
Skill Level 3	12	15.4	7	8.5			
Skill Level 4	6	7.7	6	6.1			
Mother's occupation ^a							
Without a paid job	18	23.1	21	25.6	n.s.	n.s.	
Skill Level 1	30	38.5	40	48.8			
Skill Level 2	24	30.8	11	13.4			
Skill Level 3	6	7.7	10	12.2			
Skill Level 4	0	0	0	0			

Note. DG = dyslexia group; TD = typically developing; n.s. = not statistically significant.

^aBased on the International Labour Organization (2012).

forms each contain 63 items that yield nine non-overlapping but correlated clinical scales. By circling “never,” “sometimes,” or “often,” the raters indicate whether the child has experienced problems during the past 6 months with a given behavior described in a particular item. The BRIEF-2 also provides three summary indices: the behavioral regulation index (BRI), emotional regulation index (ERI), and cognitive regulation index (CRI). The two-scale BRI includes (a) inhibition (eight items), which measures the ability to control impulses, and (b) self-monitor (four

items), which measures the ability to keep track of the effect of one's own behavior on others. The two-scale ERI includes (a) shift (eight items), which measures the ability to transfer between tasks and mind-sets, and (b) emotional control (eight items), which measures the ability to modulate emotional responses. The five-scale CRI includes (a) initiate (five items), which measures the ability to begin a task or activity independently; (b) working memory (eight items), which measures the ability to hold relevant information in the mind for the purpose of completing a task; (c)

planning–organization (eight items), which measures the ability to plan ahead and organize for future events and goals; (d) task monitoring (five items), which measures the ability to check work and assess performance during or after finishing a task to ensure attainment of goal; and (e) organization of materials (six items), which measures the ability to keep the workspace and materials organized.

Across these three indices (BRI, ERI, and CRI) and the nine subscales just listed, a global score (GEC) is comprised by the nine subscales. On all the scales, higher scores indicate more difficulties in that area. The BRIEF-2 provides *T*-scores on all scales and indices, and its reliability and validity have been widely demonstrated (Gioia et al., 2017). In the Spanish version, Cronbach's alphas range from .81 to .94 for the parent version and from .86 to .95 for the teacher version, across ages. In the current sample, Cronbach's alpha ranged from .80 to .91 for the parent version and from .83 to .94 for the teacher version.

Procedure

The study respected all principles outlined in the current legislation on clinical investigations and was approved by the Research Ethics Committee of the University of Valencia, which is regulated by the Ethical Principles for Medical Research Involving Human Subjects (Declaration of Helsinki, 1964 in World Medical Association, 2013). For example, oral permission from the children and parents' informed consent was obtained prior to commencing any study procedures.

Recruitment of participants for this study occurred by (a) contacting relevant parent associations (e.g., associations for parents of children with dyslexia) and sharing study participation information with members, and (b) contacting school psychologists from different schools throughout the region to share the same study participation information and asking them to share the information with families of children attending the school. For the DG participants, school psychologists asked teachers to recommend children from their classrooms who had low reading achievement. From that list, the psychologists informed the families of those children about the study. Participants in the TD group were recruited from the same schools of participants from the DG. School psychologists first provided general information about the study to the families of children attending the participating schools, indicating that participation required children to have average or above-average academic performance. For all parents and children who showed interest in participating in the research, the research team then provided them with more detailed information about participating in the study.

After receiving proper consent, an experienced and licensed clinical psychologist (the third author of this article) administered the aforementioned reading skills battery

and cognitive assessment according to the respective standardized protocols. These measures were administered in random order and in a room free from noise and distractions. Test sessions varied in length depending on the participant being assessed. Children and adolescents received a gift (e.g., pens, colored pencils, cases, USB memory stick) for participating.

As noted previously, recruitment procedures generated a pool of 268 potentially eligible child and adolescent participants. Using the inclusion criteria described in the "Participants" section, the research team examined all screening data to determine eligible participants for the study. Of those eligible, a parent and teacher of each participant was asked to complete the respective BRIEF-2 rating scale at his or her convenience and either return it in a sealed envelope during the student participant's second assessment session, return it via post to the third author in a self-addressed stamped envelope, or send it by email to the third author. Each teacher spent considerable time with the student participant per day (i.e., was the classroom teacher for students in primary school or taught the student in at least two different classes for students in secondary school) and knew the student well for 6 or more months, as recommended in the BRIEF-2 administration manual. As compensation, families and schools were given a report about the participants' performance in the different domains analyzed.

Data Analysis

First, descriptive analysis was used to describe the sample (see Table 1). To analyze data related to RQ1 of our study, a multivariate analysis of covariance (MANCOVA) was computed to compare parents' and teachers' perceptions of EF in children and adolescents with dyslexia compared with their TD peers. A MANCOVA was used due to (a) differences in parental educational level and occupations of fathers between groups (see "Sample Description" subsection under the "Results" section), and (b) the role of several socioeconomic variables (e.g., parental education) in EF outcomes (e.g., Deater-Deckard et al., 2012; Tillman & Granvald, 2015). Thus, for these analyses, fathers' and mothers' educational level and fathers' occupations were included as covariates (based on the dependent variables), and the group of origin (DG and TD) was the grouping factor. Next, a between-groups analysis of covariance (ANCOVA) was conducted for each measure. To control for multiple comparisons, a Bonferroni correction (an alpha level of $p < .001$) was used. We report effect sizes using the partial eta squared (η_p^2) statistic, with values between 0.01 and 0.10 considered small effect sizes, values between 0.10 and 0.49 considered medium, and values above 0.50 considered large effect sizes.

Regarding analyses for RQ2, the current literature has mixed recommendations and practices regarding the optimal method for evaluating agreements and disagreements between raters (Achenbach, 2011, 2017; De Los Reyes & Kazdin, 2004, 2005). De Los Reyes and Kazdin (2004) pointed out that the mathematical properties of the different measures of informant agreements and disagreements can lead to different conclusions and that these measures are not interchangeable. For this reason, to show a more comprehensive interpretation of the agreements and disagreements of parents' and teachers' ratings of specific impairments in singular or multiple domains of EF across contexts, we used three complementary approaches that have been recommended to assess agreements and disagreements between raters (e.g., McConaughy & Ritter, 2002; Stewart et al., 2017; Teglasi et al., 2017).

Analyses with correlation coefficients. The first method we used to assess agreement between parent and teacher ratings on each of the BRIEF-2 scales was the calculation of Pearson's correlation coefficients. We used this approach to analysis in three ways: across all participants (DG and TD participants), only for the DG, and then only for the TD group.

Analyses with CID scores. As a second method, we computed the CID score by subtracting parents' BRIEF-2 *T*-scores from teachers' *T*-scores for each participant. Positive scores indicate that teachers reported more difficulties than parents did, whereas a negative score means that parents reported more impairment than teachers. We then performed a MANCOVA with parental educational level and fathers' occupations as covariates, based on the dependent variables, with the group of origin (DG and TD) as the grouping factor. Next, a between-groups ANCOVA was conducted for each measure.

Analyses of clinically elevated scores for DG participants. In our third method, we computed the percentage of DG participants who obtained scores in the clinically elevated range. To do this, dichotomous variables were created to analyze clinically significant impairments of DG participants. Each BRIEF-2 subscale was coded as $T \leq 64 = 0$ and $T \geq 65 = 1$. Thus, as recommended by De Los Reyes and Kazdin (2004, 2005), we account for the percentage of children with clinical elevations identified by parents only, by teachers only, by both parents and teachers, and those who were not identified as impaired by either parent or teacher. To evaluate the possible differences between raters (parent vs. teacher) of clinical elevations for DG participants, we used chi-square analyses. Collectively, each of our three approaches to analyses are supported by past research (e.g., De Los Reyes & Kazdin, 2004; McConaughy & Ritter, 2002; Stewart

et al., 2017; Teglasi et al., 2017), and by using each of them, we can more comprehensively evaluate our second research question.

Results

Sample Description

There were no differences between the DG and the TD control group on age, the measure of intelligence, and sex. As would be expected, there were significant differences between the groups in word-reading accuracy, word-reading speed, word-reading fluency, pseudoword-reading accuracy, pseudoword-reading speed, and pseudoword-reading fluency, each with large effect sizes. Likewise, participants in the DG had more grade retentions, such that 10.2% of the DG had been retained and 0% of TD group had been retained. Statistically significant differences were also found on other relevant variables that differentiated the two groups. Specifically, 48.7% (DG) versus 0% (TD) attended the school's resource room, and 87.2% of the DG compared with 46.3% of TD group needed help with homework. Means, standard deviations, and statistics of these measures are in Table 1.

In both groups, parent instruments (e.g., BRIEF-2, demographic questionnaire) were filled mainly by mothers (89.7% for DG and 92.6% for TD control group). Both parents completed about 7% in each group (7.7% in DG and 7.4% in TD group) and less than 2.5% of instruments were completed only by fathers (2.5% in DG and 0% in TD group). In addition, most of the parents were married or living together (96.1% for DG and 95.1% for TD control group). Regarding educational level, both the fathers and mothers of the TD group had lower educational levels than the fathers and mothers of the DG. Finally, in relation to occupations, most of the fathers had a paid job in both groups, whereas around 20% of the mothers of both groups did not have a paid job. Occupations of fathers and mothers were distributed into occupations with four levels of skills (see Table 1). There were only significant differences in the fathers' occupations, as the occupations of the fathers of the TD group were less skilled in general. As noted previously, fathers' and mothers' educational level and fathers' occupations were used as covariates in subsequent analyses.

In both groups, teachers mainly identified as female (84.6% for the DG and 82.9% for the TD control group). Teachers' age from the DG ranged from 26 to 61 years old ($M = 39$ years, 7 months; $SD = 9$ years, 8 months), and in the TD group, ages ranged from 25 to 63 years old (M age = 37 years, 5 months; $SD = 7$ years, 5 months). In addition, most of the teachers had between 10 and 20 years of teaching experience (56.4% for DG and 58.5% for TD control group) and around 30% in both groups had more than 20 years of teaching experience (30.7% for DG and 32.9% for

TD control group). Approximately 10% of teachers of both groups had less than 10 years of teaching experience (12.8% for DG and 8.5% for TD control group).

Parent and Teacher Reports of EF (RQ1)

In relation to parent ratings, the MANCOVA performed with fathers' and mothers' educational level and fathers' occupations as covariates showed significant main effects by group, Wilks's Lambda (Λ) = .430, $F(13, 143) = 14.602$, $p < .001$, $\eta_p^2 = .57$, with a large effect size. ANCOVA showed that, compared with parents of participants in the TD group, parents rated children in the DG with significantly higher scores on inhibition with a medium effect size, and self-monitor, the BRI, emotional control, and the ERI with a small effect size in all the cases. With regard to the subscales included in the CRI, the parents also rated significantly more difficulties on initiation, working memory, planning–organization, task monitoring, organization of materials, the CRI, and the GEC score, all with a medium effect size (see Table 2).

With respect to teachers' reports, the MANCOVA performed with fathers' and mothers' educational level and fathers' occupations as covariates showed significant main effects by group, Wilks's Lambda (Λ) = .383, $F(13, 143) = 17.726$, $p < .001$, $\eta_p^2 = .61$, with a large effect size. ANCOVAs showed that teachers rated children in the DG as having significantly more executive function difficulties than their TD peers on self-monitor, the BRI, shifting, emotional control, and the ERI, all with small to medium effect sizes. In addition, teachers gave children and adolescents in the DG higher scores than their TD peers on initiation, working memory, planning–organization, task monitoring, organization of materials, the CRI, and the GEC, with medium to large effect sizes (see statistics in Table 2).

Agreements and Disagreements Among Parent and Teacher Ratings of EF (RQ2)

The first method employed to assess the agreement between raters was the calculation of Pearson's correlation coefficients across all participants (DG and TD participants), only for the DG, and then only for the TD group. In relation to the agreement between parent and teacher ratings on all the BRIEF-2 scales with the whole sample, correlations between parent and teacher ratings were moderate to high and reached a statistically significant level on all the scales and indices (see Table 2). In the DG (using a Bonferroni correction p value of .003), correlations between parent and teacher ratings were moderate and reached a statistically significant level for inhibition ($r = .388$, $p < .001$), working memory ($r = .435$, $p < .001$), organization of materials ($r = .397$, $p < .001$), BRI ($r = .435$, $p < .001$), and CRI ($r = .306$, $p < .003$), whereas in the TD group,

parent and teacher ratings were moderate and statistically significant only for working memory ($r = .340$, $p < .001$) and organization of material ($r = .300$, $p < .003$).

CID was used as the second method of analysis to examine disagreements between parents and teachers. The MANCOVA showed significant main effects by group, Wilks's Lambda (Λ) = .751, $F(13, 143) = 2.148$, $p < .001$, $\eta_p^2 = .24$, with a medium effect size. As shown in Figure 1, in both DG and TD group, teachers reported more difficulties than parents did on the majority of scales and indices. ANCOVAs showed that teachers significantly rated children and adolescents in the DG as having more difficulties than their peers in the TD group on working memory, $F(13, 143) = 16.235$, $p < .001$, $\eta_p^2 = .09$, and on the CRI, $F(13, 143) = 9.178$, $p < .001$, $\eta_p^2 = .05$, with small effect sizes. Teachers also reported more difficulties of participants in the DG than parents did in other scales, such as shift, initiate, plan–organize, and GEC (but not at statistically significant levels).

With our third method of analysis, we examined agreements and disagreements between raters by computing the percentage of children in the DG who obtained scores that exceeded clinical cutoff ranges on the BRIEF-2. As indicated in Table 3, the vast majority of parents and teachers of youth with dyslexia reported that behaviors related to behavioral and emotional regulation were not severe enough to fall within clinically significant ranges. Specifically, 100% of parents and teachers agreed that participants did not meet clinical cutoff scores for BRI and ERI, and only a small percentage of participants ($n = 1-10$) were judged to exceed clinical cutoff scores for BRI and ERI subscales (i.e., Inhibit, Self-Monitor, Shift, Emotional Control)—all of which were reflected in teachers' ratings.

With regard to behavior related to cognitive regulation as defined by the BRIEF-2, approximately 40% of participants in the DG were identified as clinically impaired in task monitoring (19.2% by parent only, 12.8% by teacher only, and 6.4% by both parent and teacher), in organization of materials (2.6% by parent only, 21.8% by teacher only, and 12.8% by both parent and teacher), or in GEC (6.1% by parent only, 28.2% by teacher only, and 3.8% by both parent and teacher). The percentage of students in the DG with clinically elevated scores was much higher for the other cognitive scales: 62.8% were identified as clinically impaired in initiate (28.2% by both parent and teacher), 82% were identified as clinically impaired in working memory (44.9% by both parent and teacher), 73.1% were impaired in plan–organize (35.9% by both parent and teacher), and 73.1% in CRI (38.5% by both parent and teacher). In nearly all of the BRIEF-2 scales, however, teachers reported more children and adolescents with dyslexia clinically impaired than parents did. This difference was statistically significant in the domains of shift, initiate, working memory, plan–organize, organization of materials, CRI, and GEC.

Table 2. Pearson's Correlation Coefficients and T-Score Means and Standard Deviations on All Scales and Indices of the BRIEF-2.

Scales and Indices of the BRIEF-2	<i>r</i>	DG (<i>n</i> = 78)		TD group (<i>n</i> = 82)				Parent statistics		Teacher statistics	
		Parent		Teacher		Parent		Teacher		Parent statistics	
		<i>M</i> ± <i>SD</i>		<i>M</i> ± <i>SD</i>		<i>M</i> ± <i>SD</i>		<i>M</i> ± <i>SD</i>		<i>F</i> (1, 155)	<i>p</i>
Inhibit ^a	.42*	49.13 ± 6.10	50.03 ± 5.31	44.95 ± 3.87	47.37 ± 5.18	44.95 ± 3.87	47.37 ± 5.18	25.699	.001	.14	n.s.
Self-monitor ^a	.44*	46.50 ± 4.99	49.06 ± 4.79	43.95 ± 3.65	45.83 ± 5.28	43.95 ± 3.65	45.83 ± 5.28	13.169	.001	.07	n.s.
Shift ^b	.37*	48.54 ± 5.64	56.36 ± 9.28	46.38 ± 5.92	49.56 ± 6.79	46.38 ± 5.92	49.56 ± 6.79	n.s.	n.s.	n.s.	.10
Emotional control ^b	.42*	48.28 ± 7.16	51.85 ± 6.13	44.01 ± 5.99	48.41 ± 4	44.01 ± 5.99	48.41 ± 4	11.414	.001	.07	.07
Initiate ^c	.50*	56.62 ± 9.99	62.23 ± 11.05	47.98 ± 8.15	47.90 ± 6.78	47.98 ± 8.15	47.90 ± 6.78	38.957	.001	.20	.37
Working memory ^c	.72*	62.18 ± 9.35	70.23 ± 13.11	46.95 ± 6.48	47.51 ± 7.13	46.95 ± 6.48	47.51 ± 7.13	125.052	.001	.44	.49
Planning—organization ^c	.62*	59.49 ± 8.67	64.64 ± 9.24	47.13 ± 5.68	47.35 ± 6.15	47.13 ± 5.68	47.35 ± 6.15	105.278	.001	.40	.50
Task monitoring ^c	.47*	56.36 ± 9.11	57.10 ± 9.27	45.68 ± 7.25	44.46 ± 9.14	45.68 ± 7.25	44.46 ± 9.14	61.310	.001	.28	.25
Organization of materials ^c	.42*	53.05 ± 10.95	57.10 ± 11.20	45.70 ± 7.11	47.88 ± 7.76	45.70 ± 7.11	47.88 ± 7.76	16.700	.001	.11	.17
Behavioral regulation index	.45*	48.03 ± 5.96	52.90 ± 5.21	44.23 ± 5.14	48.20 ± 5.46	44.23 ± 5.14	48.20 ± 5.46	14.722	.001	.08	.12
Emotional regulation index	.46*	48.13 ± 5.97	51.64 ± 4.67	44.29 ± 5.11	47.23 ± 5.38	44.29 ± 5.11	47.23 ± 5.38	14.157	.001	.08	.07
Cognitive regulation index	.64*	59.00 ± 8.48	65.26 ± 11.16	46.16 ± 6.18	46.90 ± 6.60	46.16 ± 6.18	46.90 ± 6.60	94.482	.001	.40	.47
Global executive composite	.60*	55.03 ± 7.19	61.46 ± 8.93	44.50 ± 7.21	47.22 ± 6.38	44.50 ± 7.21	47.22 ± 6.38	76.805	.001	.33	.41

Note. Correlations by subgroup (DG and TD) are summarized in the "Results" section. BRIEF-2 = Behavior Rating Inventory of Executive Function, Second Edition; DG = dyslexia group; TD = typically developing; n.s. = not statistically significant.

^aThis domain is a subscale of the behavioral regulation index. ^bThis domain is a subscale of the emotional regulation index. ^cThis domain is a subscale of the cognitive regulation index.

**p* < .001 reflecting data across the full sample (DG and TD group).

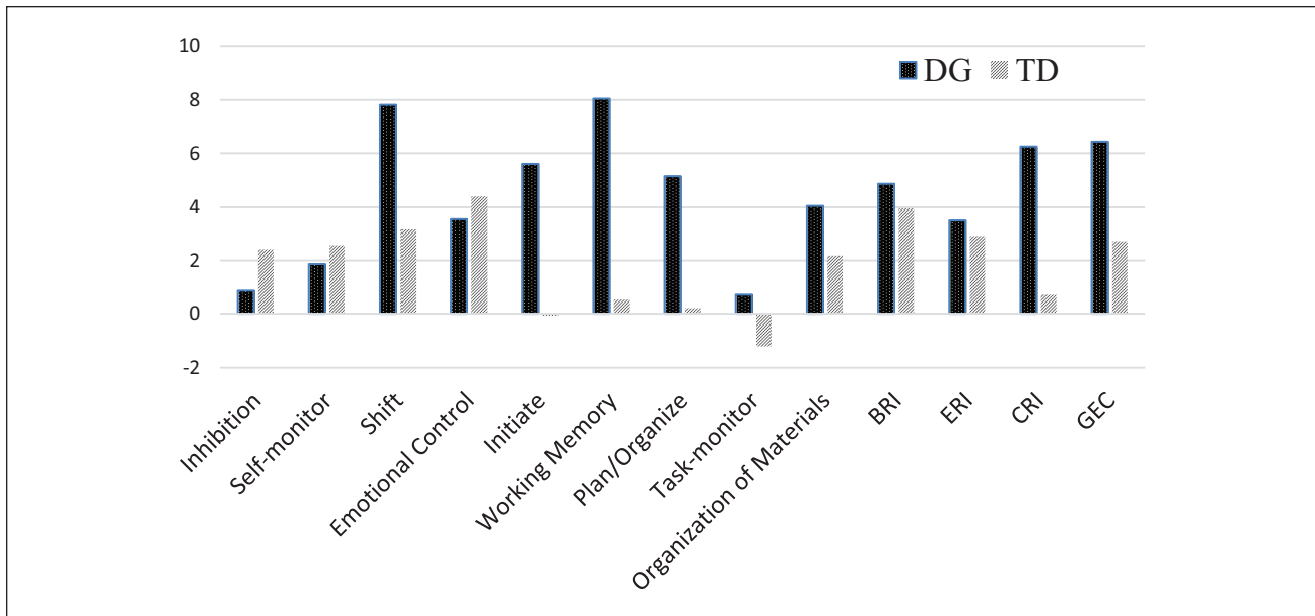


Figure 1. Mean CID scores for all scales and indices of the BRIEF-2.

Note. CID scores were calculated by subtracting parents' BRIEF-2 *T*-scores from teachers' *T*-scores. Positive scores indicate that teachers reported more difficulties than parents did, and negative scores indicate the opposite. CID = cross-informant disagreement; BRIEF-2 = *Behavior Rating Inventory of Executive Function, Second Edition*; DG = dyslexia group; TD = typically developing; BRI = behavioral regulation index; ERI = emotional regulation index; CRI = cognitive regulation index; GEC = global executive composite.

Table 3. Among Participants With Dyslexia, Percentage of Parent and Teacher Ratings Above a Clinically Elevated *T*-Score.

Scales and Indices of the BRIEF-2	Parent	Teacher	Parent + teacher	Neither parents nor teachers	Parents versus teachers	
	% (n) <i>T</i> > 65	% (n) <i>T</i> > 65	% (n) <i>T</i> > 65	% (n) <i>T</i> > 65	$\chi^2_{(1)}$	<i>p</i>
Inhibit	(0)	2.6 (2)	(0)	97.4 (76)	n.s.	n.s.
Self-monitor	(0)	1.3 (1)	(0)	98.7 (77)	n.s.	n.s.
Shift	(0)	12.8 (10)	(0)	87.2 (68)	11.282	.001
Emotional control	(0)	2.6 (2)	(0)	97.4 (76)	n.s.	n.s.
Initiate	9.0 (7)	25.6 (20)	28.2 (22)	37.2 (29)	7.782	.01
Working memory	3.8 (3)	33.3 (26)	44.9 (35)	17.9 (14)	30.307	.001
Planning–organization	10.3 (8)	26.9 (21)	35.9 (28)	26.9 (21)	8.417	.01
Task monitoring	19.2 (15)	12.8 (10)	6.4 (5)	61.5 (48)	n.s.	n.s.
Organization of materials	2.6 (2)	21.8 (17)	12.8 (10)	62.8 (49)	11.572	.001
Behavioral regulation index	(0)	(0)	(0)	100 (78)		
Emotional regulation index	(0)	(0)	(0)	100 (78)		
Cognitive regulation index	6.4 (4)	28.2 (22)	38.5 (30)	28.2 (22)	15.911	.001
Global executive composite	6.1 (5)	28.2 (22)	3.8 (3)	61.5 (48)	12.947	.001

Note. Only data from the DG are reported because very few students in the TD group were reported to have clinically elevated scores. Specifically, only two students from the TD group were reported to have a clinically elevated score within the BRIEF-2 Index scales—both reflected difficulty only in the cognitive regulation index, and clinically elevated scores were reported by teachers but not by parents. For the behavioral regulation and emotional regulation indices, the chi-square cannot be calculated because the value of zero cases is a constant. n.s. = not statistically significant; DG = dyslexia group; TD = typically developing; BRIEF-2 = *Behavior Rating Inventory of Executive Function, Second Edition*.

Discussion

To our knowledge, this study is the first to investigate parent and teacher perceptions of EF skills of children and

adolescents with dyslexia, compared with TD peers, using a commonly used rating scale designed to assess perceptions about different empirically established domains (i.e., cognitive, behavioral, and emotional) of EF. By examining these

three domains of EF in two differing contexts (i.e., home and school) that involve different EF demands, this allows for a more comprehensive assessment and an ability to examine possible agreements and disagreements between parents and teachers.

Parent and Teacher Reports of EF

The first research question of the study was to examine whether there were differences in how students with dyslexia were rated (by parents and teachers) on EF behaviors compared with peers without dyslexia. We found that children and adolescents with dyslexia were rated by parents and teachers as having significantly worse EF than TD controls on nearly every subscale and index of the BRIEF-2. Thus, both parent and teacher ratings reflected larger differences in impairment for those in the DG versus TD group on cognitive domain (e.g., initiation, working memory, planning–organization, task monitoring, organization of materials, and CRI), behavioral domain (e.g., self-monitor, BRI), and emotional domain (e.g., emotional control, ERI), and on GEC. However, parents reported more inhibition difficulties (behavioral domain) with DG participants, whereas teachers reported more difficulties in shift (emotional domain) among students in the DG. Although our findings from parents were consistent with the small number of past studies that examined EF of children and adolescents with dyslexia (Gioia et al., 2002b; Locascio et al., 2010; Schöfl et al., 2014), we also identified additional differences in teacher-reported EF concerns between DG and TD group. These findings help to provide new insights into patterns of teacher-reported EF concerns in children and adolescents with dyslexia.

Agreements and Disagreements Among Parent and Teacher Ratings of EF

With respect to our second research question—to evaluate multi-informant agreements and disagreements among parent and teacher raters of EF—there were important indicators of both agreement and disagreement. In relation to agreements between parent and teacher ratings, correlation coefficients across all participants were moderate to high and statistically significant on all BRIEF-2 scales and indices. These results are consistent with those reported with a normative sample by Gioia et al. (2015, 2017), possibly because BRIEF-2 parent and teacher forms have 85% of the items in common. However, within each group, the correlations were moderate only in a few subscales. No past studies have evaluated the relationship of ratings between parents and teachers for students with dyslexia, so this initial study suggests that with this subpopulation of students, we may not see as high of an agreement level between parents and teachers compared with TD samples.

We also found agreements between parents and teachers about clinically elevated scores. There was strong agreement among parents and teachers that students in the TD group did not exhibit clinically elevated behavior. Similarly, parents and teachers had high levels of agreement to suggest that most participants with dyslexia did not have clinically elevated EF difficulties related to behavioral and emotional regulation. However, we also found notable disagreements between parents and teachers. Results from CID analyses showed that in both the DG and TD group, teachers reported more difficulties than parents did on some cognitive (e.g., initiate, working memory, plan–organize) and emotional (e.g., shift) domains and indices (e.g., CRI and GEC), especially in working memory and in the CRI. Furthermore, we found notable disagreements between parents and teachers in the cognitive domain, and found that teachers more often reported clinically elevated difficulties. To illustrate, 25% to 33% of the teachers perceived students to have clinically elevated scores on the initiate, working memory, plan–organize, CRI, and GEC domains, whereas none of the parents of those students rated their behavior as clinically elevated in those domains. In the behavioral (e.g., inhibit, self-monitor) and in the emotional (e.g., shift, emotional control) domains, teachers judged a small percentage of participants ($n = 1\text{--}10$) to exceed clinical cutoff scores. In summary, teachers reported more variety and severity of EF impairments in youth with dyslexia than parents did.

Oftentimes, informant disagreements are explained by measurement error or as an informant bias (see De Los Reyes et al., 2013). That is, informants' ratings are influenced by personal biases, prior experiences, and/or beliefs (Collett et al., 2003a, 2003b). However, CID may reflect true setting-related (e.g., home and school) differences and/or differences in an informant's knowledge and experiences (Achenbach, 2011, 2017; De Los Reyes & Kazdin, 2004, 2005). Thus, disagreements between reporters could be the result of cross-situational differences in children's or adolescents' behavior, or differences in raters' perceptions and expectations. In this context, our results may suggest that teachers' training and familiarity with age-appropriate behavior enables them to more readily recognize difficulties within the EF domain, and they may have more opportunities to make age-appropriate comparisons. In addition, the school environment is likely to be more structured and less flexible than the home environment. In school, children and adolescents are required to regulate and monitor their behavior, plan and organize for current and future tasks, and use working memory to complete tasks and solve problems. By contrast, the home environment can be more accommodating and tolerant with EF impairments.

Implications for Practice and Research

There are several implications to consider based on our findings. First, there are now a few studies showing that parents or teachers perceive a relatively large subset of students with reading disabilities to have clinically elevated impairments in EF, particularly in the context of cognitive regulation behaviors such as working memory, planning, and organizing. For parents, educators, and clinicians, this emerging evidence suggests that assessment for students with dyslexia might also include an assessment of EF. By assessing EF with this population of students, their relative strengths and challenges may be better understood, thereby influencing how to best support students with reading disabilities. Indeed, comprehensive intervention planning for academic support often lacks critical components, such as conducting relevant behavioral or environmental assessments (e.g., Begeney et al., 2012; Best et al., 2011; Diamond, 2013), and this study provides further evidence that students with reading difficulties will likely benefit from assessment that extends beyond literacy skills.

In addition, our study is among the first to demonstrate that EF behaviors of students with dyslexia may be rated in meaningfully different ways between parents and teachers. As a potential implication for both researchers and practitioners, we suggest that both teachers and parents rate EF behaviors of students with reading disabilities to establish a more comprehensive understanding of a student's strengths, weaknesses, and (potentially) clinically elevated difficulties. Teachers may be better able to identify more and/or different EF difficulties in children and adolescents with dyslexia due to their normative experiences with approximately 20+ students each year, a more structured environment, and a range of educationally demanding activities with a given child. Parents of students with dyslexia may rate EF less severely and/or perceive different EF deficits because (a) the home environment or activities may not challenge their EF as much as school or (b) less structure in the home could make EF deficits less evident. Future research could also consider how differences in EF ratings between informants may have implications for how EF is conceptualized and defined.

When considering the need to have multiple informants and measures of EF for students with dyslexia, this suggests that intervention support plans may also need to be context specific. For example, when developing a comprehensive support plan, understanding the level of EF impairment at home *and* school should be useful in best supporting the students (Best et al., 2011; Zelazo et al., 2016). School-based supports may need to focus not only on reading intervention but also on assisting the student with working memory, initiating literacy tasks, and keeping relevant materials organized. In many cases, the same student will also benefit from home-based support systems; however,

EF difficulties at home may be different from those observed in school. If so, those specific EF difficulties observed in the home setting (e.g., task monitoring) may be a specific focus during intervention planning.

Limitations and Other Future Research

Directions

Although relevant implications can be drawn from this study and how it extends similar research, study limitations and future research directions are important to elucidate. First, the present study included a relatively comprehensive assessment of participants' reading skills, but it did not assess all important aspects of literacy (e.g., reading comprehension or writing skills). Future research in this area should consider the depth and breadth of literacy assessment that is necessary to determine the presence of a reading disability. Similarly, although rating scales continue to be advocated for as an assessment of EF that supports treatment planning and evaluation (e.g., Isquith et al., 2014), and although a goal of our study was to expand the existing research by using rating scales of EF across multiple informants, our study did not use performance-based measures or direct observations of EF. It is therefore possible that additional evaluation of participants' EF could have impacted data interpretation. With this in mind, future studies might seek to expand on past studies by evaluating EF with performance measures, self-report measures (i.e., from those with dyslexia), and ratings from different informants (e.g., parents and multiple types of teachers, such as classroom teachers and special education teachers). Finally, the present study did not evaluate the potential impacts of teachers' training in areas such as reading, dyslexia, or special education. Empirical data about Spanish teachers' knowledge about dyslexia are quite scarce (Echegaray-Bengoa & Soriano-Ferrer, 2016; Soriano-Ferrer et al., 2016), so future research should consider knowledge and training in the context of teacher ratings.

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2.5.2.- Estudio 2

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Article

Beyond Reading: Psychological and Mental Health Needs in Adolescents with Dyslexia

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Abstract: Background. Overall, children and adolescents diagnosed with dyslexia or ADHD show an increased risk for psychological and mental health problems, and dyslexia and ADHD tend to coexist frequently. Thus, the main objective of this study was to examine psychological and mental health problems in dyslexia. Method. Participated 95 adolescents with dyslexia (DG), comorbid dyslexia + attention-deficit hyperactivity disorder, combined subtype (D + ADHD-CG), and a comparison group with typical development (TDCG). Self-reported measures of anxiety and depression, and parent and teacher versions of the Strengths and Difficulties Questionnaire (SDQ) were used. Results. Self-reports of internalizing problems showed that adolescents in the GD and D + ADHD-CG groups had more depression and stated anxiety problems with a very high percentage above the clinical cut-off point than the CG. Both the parent and teacher reports showed that the DG and D + ADHD-CG groups obtained higher mean values and a higher number of adolescents above the clinical cut-off of internalizing, externalizing, and total problems than the TDCG. The comorbid D + ADHD-CG group had the highest internalizing and externalizing problems. Conclusions. In conclusion, our findings indicate that the internalizing and externalizing problems experienced by adolescents with dyslexia and comorbid ADHD should be recognized early and treated promptly by education professionals.

Keywords: dyslexia; attention-deficit/hyperactivity disorder; internalizing problems; externalizing problems; SDQ; teachers; parents; self-reports



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1. Introduction

Achieving school-age reading proficiency is a public health issue as it is a good determinant of health and longevity and is associated with many indicators of academic, social, career, and even economic success [1–3]. However, the process of learning to read is fraught with difficulties and frustrations for some children. The latest edition of the Diagnostic and Statistical System of Mental Disorders [4] encompasses these difficulties known by the term dyslexia within “specific learning disorders”, which impede the ability to learn or use specific academic skills such as reading, writing, or arithmetic. Moreover, the difficulties are unexpected and cannot be explained by the lack of teaching, visual or auditory problems, or intellectual disability [4–6]. Two recent meta-analyses [7,8] indicated that this specific learning difficulty is very frequent, affecting around 7% of the world population, depending on the transparency of the orthographic system of the language and culture. Specifically in Spain, the prevalence has been estimated at 6% of secondary school students [9,10].

In addition to academic difficulties, students with dyslexia are at high risk for mental health problems, which commonly include measures of internalizing problems [11–16] as well as high levels of externalizing problems [12,13,17]. Traditionally, in child psychopathology [18], internalizing behavior refers to problems that occur primarily within oneself such as anxiety, depression, social isolation, and somatic complaints. On the other hand, externalized behavior includes conflicts with other people and is characterized by impulsivity, hyperactivity, aggressiveness, and rulebreaking.

Students with dyslexia may be more vulnerable to experiencing internalized disorders (e.g., anxiety and depression), possibly due to a low opinion of academic competence coupled with repeated experiences of academic failure [15,19,20]. For example, a meta-analysis of 42 studies revealed that about 70% of students with learning disabilities experienced greater anxiety symptoms than students without learning disabilities [21]. Another meta-analysis [22] conducted to understand depression among students with learning disabilities found higher scores on measures of depression than their peers without learning disabilities, which was true regardless of who reported depression-related symptoms (i.e., self-report, parents, or teachers). Similarly, some recent systematic review and meta-analysis studies [21,23,24] found that poor readers were at greater risk of experiencing anxiety and depression than normal learners with moderate to large effect sizes. In relation to depressive symptomatology, some studies [11,25,26] have found strong links between severe and persistent reading disabilities and an increased risk of depressive mood. However, other studies [27–30] have shown discrepant results, possibly due to inconsistencies and heterogeneity across studies [21,31]. The lack of significant differences between dyslexia and controls could be attributed to the age of the participants included in the studies. In line with this, a review of studies [32] found an increase in emotional symptomatology with increasing age in participants with dyslexia. Thus, adolescents with dyslexia presented a higher level of self-perceived anxiety, depression, and somatic symptoms while in childhood, no significant differences between dyslexics and controls appeared [33].

On the other hand, many studies have reported an increase in externalizing problems such as antisocial and aggressive behaviors among poor readers [12,16,20,34–36]. Externalizing behaviors and withdrawal behaviors can distract children from instruction and classroom activities, interfering with their ability to learn, leading to delayed reading acquisition and low achievement [37].

Different studies [38–40] have confirmed that students with dyslexia experienced significantly more internalizing, externalizing, and attention and behavioral problems according to the ratings of teachers, parents, and even the participants themselves. Many of these problems were even found to be above the clinical cut-off point [40].

In fact, learning disabilities such as dyslexia and attention-deficit hyperactivity disorder (ADHD) show high comorbidity [16,41]. In addition, students with ADHD also show high comorbidity with learning disabilities [42,43] and present greater internalizing and externalizing problems as reported by parents and teachers than their control peers [16,44–46].

In general, research has highlighted that children diagnosed with dyslexia or ADHD show an increased risk of internalizing and externalizing problems, and that dyslexia and ADHD tend to show high comorbidity [16]. For this reason, the comorbid group of dyslexia plus ADHD carries a higher risk of internalizing and externalizing problems than children with only dyslexia [31]. Therefore, the main aim of this study was to examine whether internalizing and externalizing problems varied in adolescents with dyslexia, with and without comorbid ADHD, and combined subtype using different sources of information such as self-reports as well as ratings of parents and teachers.

2. Materials and Methods

2.1. Participants

Ninety-five adolescents aged 12 to 15 years, together with their parents and teachers, participated in this study: 34 with dyslexia (DG), 28 with dyslexia + attention-deficit hyperactivity disorder (D + ADHD-CG), and 33 with typical development (TDCG). At the time of the study, all participants, from 13 secondary schools, lived in Spain and their mother tongue was Spanish. Table 1 shows the sociodemographic characteristics of all of the participants.

Dyslexia group (DG). Thirty-four adolescents with dyslexia, ranging in age from 12 to 15 years (mean age = 12 years and 10 months, SD = 0 year and 11 months; 79% male) participated. The DSM-5-TR [4] criteria specified to identify students with a specific

learning disorder were used: (a) scores at or above 80 on an intelligence test [47], in order to exclude students with cognitive impairments; (b) absence of evidence or history of neurological damage, significant economic disadvantage, emotional disturbance, hearing or visual abnormalities, or any other significant disabling condition; and (c) a reading achievement score at or below the 25th percentile on the word and/or pseudoword reading skills subtests (accuracy and/or speed) of the Standardized Reading Skills Battery PROLEC-SE-R [48]. Two participants (5.9%) had been retained in a grade, 50% (n = 17) had received services in the school resource room prior to this study, and 79.4% (n = 27) had been reported by their teachers as needing help with their homework.

Table 1. Descriptive characteristics of adolescents and their families.

	DG (N = 34)	D + ADHD-CG (N = 28)	TDCG (N = 33)	Statistics		
	M (SD)	M (SD)	M (SD)	$F_{(2, 92)}$	p	η_p^2
Adolescent Age	12.88 (0.98)	13.19 (1.2)	12.71 (0.76)	1.75	0.17	0.03
Adolescent IQ	103.1 (8.9)	103.4 (12.4)	102.5 (15.5)	0.034	0.96	0.00
Age mother	42.2 (4.4)	44.9 (5.1)	44.5 (5.3)	2.91	0.06	0.06
Age father	46.3 (5.1)	47.4 (4.5)	47.6 (4.9)	0.76	0.29	0.02
Adolescent Sex	n (%)	n (%)	n (%)	$X_{(2)}^2$	p	
Male	27 (79.4)	21 (75)	25 (75.8)	0.201	0.90	
Female	7 (20.6)	7 (25)	8 (24.2)			
Marital Status	n (%)	n (%)	n (%)	$X_{(2)}^2$	p	
Married/living together	33 (97.1)	26 (92.9)	30 (90.9)	1.116	0.57	
Alone/widower/divorced	1 (2.9)	2 (7.1)	3 (9.1)			
Mother's occupation ^a	n (%)	n (%)	n (%)	$X_{(6)}^2$	p	
Without paid job	8 (23.5)	0 (0)	8 (24.2)	28.72	0.001	
Skill level 1	17 (50)	8 (28.6)	14 (42.4)			
Skill level 2	7 (20.6)	20 (71.4)	6 (18.2)			
Skill level 3	2 (5.9)	0 (0)	5 (15.2)			
Skill level 4	0 (0)	0 (0)	0 (0)			
Father's occupation ^a	n (%)	n (%)	n (%)	$X_{(8)}^2$	p	
Without paid job	0 (0)	5 (17.5)	0 (0)	24.78	0.002	
Skill level 1	3 (8.8)	0 (0)	5 (15.2)			
Skill level 2	24 (70.6)	23 (82.1)	19 (57.6)			
Skill level 3	6 (17.6)	0 (0)	7 (21.2)			
Skill level 4	1 (2.9)	0 (0)	2 (6.1)			

Note. ^a Based on the International Standard Classification of Occupations [49].

Dyslexia + Attention-Deficit Hyperactivity Disorder group (D + ADHD-CG). Twenty-eight adolescents participated, meeting both dyslexia and the combined subtype of ADHD, according to the DSM-5-TR criteria [4]. All adolescents had a previous diagnosis of ADHD combined subtype by mental health services, which was confirmed prior to their participation in this study. Thus, all of them presented the following criteria: six or more symptoms of inattention and six or more symptoms of hyperactivity-impulsivity according to parent and teacher assessments; persistence of symptoms for more than 6 months; and onset of symptoms before the age of 12 years. In addition, ADHD symptoms would interfere with the subject's daily academic and/or social functioning. Exclusion criteria applied included having an IQ below 80, autism, psychosis, epilepsy, or any other neurological or genetic disease. The age range of the 28 adolescents in the D + ADHD-CG group ranged from 12 to 15 years (mean age = 13 years and 2 months, SD = 1 year and 2 months; 75% male). Less than 50% of the adolescents were receiving psychopharmacological (42.4%; n = 14) or psychological (36.4%; n = 12) treatment. Two participants (7.1%) had been retained in a grade, 67.9% (n = 19) had received services in the school resource room prior to this

study, and 100% ($n = 28$) had been informed by the teacher that they needed help with their homework.

Typical Development Comparison Group (TDCG). Thirty-three adolescents in the typically developing control group attended regular classrooms and did not receive educational services outside their regular classroom. All participants in the CG group met the following criteria: (a) average or above average academic performance in all areas according to their teachers' reports; (b) scores of 80 or above in intelligence; and (c) a reading achievement score equal to or above the 50th percentile on the word and pseudoword reading skills subtests of the Standardized Reading Skills Battery PROLEC-SE-R [48]. The age range of the 33 adolescents was between 12 and 15 years (mean age = 12 years and 8 months, $SD = 0$ year and 9 months. 75% male). None of the adolescents had been retained in a grade or attended the resource room. However, 6.1% ($n = 2$) had needed help with their homework. In some cases, information on the children's academic and developmental history was obtained from the school's psychoeducational support services, and in other cases, this information was obtained from the student's family.

Demographic characteristics about the adolescents and families are presented in Table 1. There were no statistically significant differences between the three groups of adolescents in IQ and sex. In relation to the families, there were no statistically significant differences between the three groups in terms of parents' age nor marital status. However, statistically significant differences were found in the mother's occupation, $X_{(8)}^2 = 28.72$, $p < 0.001$, and in the father's occupation, $X_{(8)}^2 = 24.78$, $p < 0.002$, so these variables were used as a covariate in the later analysis.

2.2. Measures

Intelligence. We used Factor g-R [47] to assess the general mental capacity without the interference of verbal stimuli. The reliability of the Spanish adaptation of this intelligence test is 0.93. In the current sample, the Cronbach's alpha was 0.87.

Standardized Reading Skills Battery. Each adolescent's word and pseudoword reading skills were measured with the Standardized Reading Skills Battery PROLEC-SE-R [48]. Word reading requires the correct identification of 96 words that vary greatly in frequency, length, and spelling structure, and pseudoword reading consists of pronouncing 48 pseudowords. In word and pseudoword reading, task completion is timed. These reading batteries had an adequate internal consistency with a Cronbach's alpha > 0.95 for words and 0.77 for pseudoword reading in both the normalization sample and the current one.

Demographic Information Questionnaire. Parents supplied information about their sex, occupation [49], and marital status. They also responded to items about their child's past and current schooling (e.g., number of grade retentions and whether they received help with their homework).

Anxiety. Adolescents completed the Spanish adaptation of the State-Trait Anxiety Inventory for Children STAIC; [50]. The STAIC distinguishes between a general proneness to anxious behavior rooted in personality (trait anxiety subscale) and anxiety as a fleeting emotional state (state anxiety subscale). Each subscale includes 20 Likert-type items, scoring on a 3-point scale ranging from 1 (almost never) to 3 (almost always). The Cronbach's alpha is reported to be above 0.90 [50].

Depression. The Child Depression Inventory CDI; [51] is composed of 27 items that assess depressive symptomatology. The CDI assesses two scales: dysphoria (depressive mood, sadness, worry, etc.) and negative self-esteem (judgments of ineffectiveness, ugliness, meanness, etc.) and provides a total depression score. Each of the items has three response options that score 0 (no symptomatology), 1 (mild symptomatology), or 2 (severe symptomatology). Half of the items begin with the option that reflects the greatest severity of the symptom, and in the rest, the sequence of presentation is reversed. The score is obtained by adding each of the values attributed according to the child's choice of response; therefore, the higher the score, the greater the intensity of depressive symptomatology presented, and a maximum score of 54 can be obtained. A score of 19 on the total scale

represents the 90th percentile (a frequent cut-off point for screening depressed samples), and the scale usually has an alpha coefficient above 0.80 [51].

Emotional and Behavioral problems. The Spanish version of the Strengths and Difficulties Questionnaire (SDQ) for parents and teachers [52,53], which is designed to gather information about the emotional and behavioral difficulties experienced by children from 4 to 17 years old, was used. The SDQ queries positive and negative attributes displayed by the adolescents in the past 6 months across five subscales: emotional symptoms (e.g., often unhappy, down-hearted), conduct problems (e.g., often has temper tantrums or hot temper) and hyperactivity-inattention (e.g., restless, overactive, cannot stay still for long), peer relationship problems (e.g., tends to play alone), and prosocial behavior (e.g., considerate of other people's feelings). Each subscale is measured by five items, rated by a 3-point scale ranging from 0 (strongly disagree) and 2 (strongly agree). To obtain the total scores, items are summed. Spanish normative data [54] set at the 90th percentile were used as the clinical cut-off range, except for the prosocial behavior subscale, where we used the 20th percentile. The test has been shown to have criterion validity and good test-retest reliability after four and six months (mean = 0.62). Furthermore, the internal consistency is satisfactory, with a Cronbach's alpha ranging from 0.57 to 0.88 [52]. The Spanish adaptation [53] showed an internal consistency for total difficulties score of 0.84, ranging from 0.75 to 0.78 for the SDQ subscales. In the current sample, the Cronbach's alpha was 0.96 for emotional problems, 0.92 for conduct and peer relationship problems, and 0.82 for hyperactivity-inattention and prosocial behavior.

2.3. Data Analysis

Data were analyzed using SPSS version 24. First, descriptive statistics were used in order to describe the characteristics of the participants (see Table 1). Therefore, in the case of continuous variables, the mean and SD are provided, while frequencies and percentages are provided for categorical variables. In order to compare psychological and mental health problems between groups, after verifying that the data fulfilled the criterion of statistical normality, applying the Kolmogorov–Smirnov test, a multivariate analysis of covariance (MANCOVA) was performed with the parents' occupations as covariates (mothers and fathers) due to the statistically significant differences between groups (see participants section) and the group of origin (DG, D + ADHD-CG, TDCG) as a grouping factor. Next, a between-groups analysis of covariance (ANCOVA) was conducted for each measure with the parents' occupations as covariates (mothers and fathers). To control for multiple comparisons, a Bonferroni correction ($0.05/17 = 0.002$) was applied in order to determine the significance levels. We report the effect sizes using the partial eta squared statistic (η_p^2) with values between 0.01 and 0.10 considered small effect sizes, values between 0.10 and 0.49 considered medium, and values above 0.50 considered large effect sizes. Subsequently, the Bonferroni post hoc test was applied to check the differences between pairs of groups. Additionally, we computed the percentage of adolescents in each group who obtained scores in the clinically elevated range. To do this, dichotomous variables were created to analyze clinically significant impairments of the participants. Each measure was coded as 0 (below 90th percentile) and 1 (above 90th percentile), except for the SDQ prosocial behavior subscale, where we used the 20th percentile.

3. Results

The MANCOVA performed with the parents' occupations as covariates showed significant main effects by group (Wilks' Lambda (Λ) = 1197, $F_{(32, 152)} = 7.081$, $p < 0.001$, $\eta_p^2 = 0.60$), with a large effect size.

In relation to mental health problems, results of the ANCOVAs showed significant differences between groups in the majority of variables (see Table 2). Thus, the results showed significant differences between groups in dysphoria, $F_{(2, 90)} = 37.604$, $p < 0.001$, $\eta_p^2 = 0.45$, and in negative self-esteem, $F_{(2, 90)} = 21.953$, $p < 0.001$, $\eta_p^2 = 0.32$, total depression, $F_{(2, 90)} = 35.687$, $p < 0.001$, $\eta_p^2 = 0.44$, and state anxiety, $F_{(2, 90)} = 30.101$, $p < 0.001$,

$\eta_p^2 = 0.40$, with a medium effect size. The Bonferroni post hoc showed that in all cases, the DG and D + ADHD-CG groups had more internalizing problems than the other group (TDCG). In addition, there were no significant differences between the DG group and the D + ADHD-CG group. As shown in Table 2, 58.8% in the DG and 60.7% in the D + ADHD-CG groups scored above the clinical cut-off point (above the 90th percentile) in total depression. On the other hand, between 88.2% in DG and 100% of adolescents in the D + ADHD-CG group were identified as clinically impaired in state anxiety (above the 90th percentile). In relation to trait anxiety, the results of the ANCOVAs did not show significant differences between groups. Nevertheless, around 12% of adolescents in the DG and 14% in the D + ADHD-CG groups were identified as clinically impaired in trait anxiety (above 90th percentile), whereas 0% were identified in the TDCG (see Table 3).

Table 2. Comparison of mental health (depression and anxiety) problems.

	DG (N = 34)		D + ADHD-CG (N = 28)		TDCG (N = 33)		$F_{(2, 90)}$	p	η_p^2
	M	SD	M	SD	M	SD			
CDI—Dysphoria	6.62	2.36	7.39	2.37	2.45	2.30	37.604	0.001	0.45
CDI—Negative Self-Esteem	10.62	2.72	11.04	2.70	6.82	3	21.953	0.001	0.32
CDI—Total Depression Score	17.24	4.20	18.46	4.70	9.27	4.95	35.687	0.001	0.44
STAIC—Trait Anxiety	36.21	7.45	36.07	7.69	32.21	5.04	4.637	0.012	0.09
STAIC—State Anxiety	47.85	10.02	53.21	5.23	36	8.04	30.101	0.001	0.40

Table 3. N and percentage of adolescents above a clinically elevated score.

	DG (N = 34)	D + ADHD-CG (N = 28)	TDCG (N = 33)
	n (%)	n (%)	n (%)
CDI—Total Depression Score	20 (58.8)	17 (60.7)	2 (6.1)
STAIC—Trait Anxiety	4 (11.8)	4 (14.3)	0 (0)
STAIC—State Anxiety	30 (88.2)	28 (100)	3 (9.1)

In relation to the parents' ratings of internalizing and externalizing problems, results of the ANCOVAs showed significant differences between groups in the majority of variables (see Table 4). Therefore, the results showed significant differences between groups in emotional symptoms, $F_{(2, 90)} = 20.746$, $p < 0.001$, $\eta_p^2 = 0.31$ and in conduct problems, $F_{(2, 90)} = 8.227$, $p < 0.001$, $\eta_p^2 = 0.15$, with a medium effect size, and in inattention-hyperactivity, $F_{(2, 90)} = 62.100$, $p < 0.001$, $\eta_p^2 = 0.58$ and total difficulties, $F_{(2, 90)} = 45.650$, $p < 0.001$, $\eta_p^2 = 0.50$ with a large effect size. The Bonferroni post hoc showed that in all cases, the D + ADHD-CG group had more emotional and behavioral problems than the other two groups (DG and CG). Additionally, the DG group also showed significantly more emotional and behavioral problems than the CG, with the exception of conduct problems, where there were no differences between the DG and TDCG groups. As indicated in Table 5, the parents reported as clinically impaired in emotional symptoms was 50% of D + ADHD-CG, 24% of DG, and 3% of TDCG; in terms of conduct problems and the total scale, 18% of D + ADHD-CG, 12% of DG, and 0% in TDCG were identified as clinically impaired. Finally, in the inattention-hyperactivity subscale, 96.4% of D + ADHD-CG and 56% of DG were identified by their parents as clinically impaired.

In relation to peer problems and prosocial behaviors, the results of ANCOVAs did not show significant differences between groups. Nevertheless, in peer problems, around 43% of adolescents in the D + ADHD-CG group were identified as clinically elevated by their parents, whereas parents identified around 10% in peer problems in the DG and TDCG (see Table 5). Additionally, the parents reported more adolescents with less prosocial behaviors in the D + ADHD-CG (29%) group than in the others two groups (0% in DG and 6% in TDCG).

Table 4. Comparison of the parents' ratings on emotional and behavioral problems.

SDQ	DG (N = 34)		D + ADHD-CG (N = 28)		TDCG (N = 33)		$F_{(2, 90)}$	p	η_p^2
	M	SD	M	SD	M	SD			
Emotional Symptoms	2.68	2.5	4.4	2.2	0.88	1.08	20.746	0.001	0.31
Conduct Problems	1.32	1.47	1.54	1.5	0.52	0.56	8.227	0.001	0.15
Inattention-Hyperact.	4.62	2.4	7	1.33	1.58	1.6	62.100	0.001	0.58
Peer Problems	1.82	2.4	2.29	2.1	0.94	1.4	2.673	0.074	0.05
Prosocial Behaviors	8.44	3.1	8.4	1.3	8.70	1.4	0.192	0.825	0.00
Total Difficulties	9.85	5.51	15.11	4.4	3.91	3.5	45.650	0.001	0.50

Table 5. N and percentage of the ratings of the parents and teachers above a clinically elevated score in each group.

	DG (N = 34)		D + ADHD -CG (N = 28)		TDCG (N = 33)	
	Parent	Teacher	Parent	Teacher	Parent	Teacher
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Emotional Symptoms	8 (23.5)	14 (41.2)	14 (50)	21 (75)	1 (3)	0 (0)
Conduct Problems	4 (11.8)	1 (2.9)	5 (17.9)	14 (50)	0 (0)	0 (0)
Inattention-Hyperact.	19 (55.9)	7 (20.6)	27 (96.4)	28 (100)	1 (3)	0 (0)
Peer Problems	4 (11.8)	5 (14.7)	12 (42.9)	7 (25)	3 (9.1)	3 (9.1)
Prosocial Behaviors	0 (0)	2 (5.8)	8 (28.6)	3 (10.3)	2 (6.1)	0 (0)
Total Difficulties	4 (11.8)	2 (5.2)	5 (17.9)	18 (64.3)	0 (0)	0 (0)

With regard to the teachers' ratings of emotional and behavioral problems, the results of the ANCOVAs showed significant differences between groups (see Table 6) in emotional symptoms, $F_{(2, 90)} = 27.176$, $p < 0.001$, $\eta_p^2 = 0.38$ and in conduct problems, $F_{(2, 90)} = 26.347$, $p < 0.001$, $\eta_p^2 = 0.37$ with a medium effect size, and in inattention-hyperactivity, $F_{(2, 90)} = 137.95$, $p < 0.001$, $\eta_p^2 = 0.75$ and total difficulties, $F_{(2, 90)} = 13.642$, $p < 0.001$, $\eta_p^2 = 0.65$ with a large effect size. The Bonferroni post hoc showed that in all cases, the D + ADHD-CG group had more emotional and behavioral problems than the other two groups (DG and TDCG). Additionally, the DG group also showed significantly more emotional and behavioral problems than the TDCG, with the exception of conduct problems, where there were no differences between the DG and TDCG groups.

Table 6. Comparison of the teachers' ratings on emotional and behavioral problems.

	DG (N = 34)		D + ADHD-CG (N = 28)		TDCG (N = 33)		$F_{(2, 90)}$	p	η_p^2
	M	SD	M	SD	M	SD			
Emotional Symptoms	2.1	2.1	4.04	1.9	0.76	1	27.176	0.001	0.38
Conduct Problems	0.65	0.88	3.93	3.1	0.21	0.55	26.347	0.001	0.37
Inattention-Hyperact.	3.6	1.43	6.9	0.47	1.15	1.5	137.957	0.001	0.75
Peer Problems	0.71	1.3	2.1	2.2	0.61	1.29	4.476	0.01	0.09
Prosocial Behaviors	7.41	2.65	6.96	1.75	8.45	1.9	2.860	0.062	0.06
Total Difficulties	7.1	3.4	16.9	5.2	2.73	2.94	13.642	0.001	0.65

As indicated in Table 5, teachers reported 75% of D + ADHD-CG, 40% of DG, and 0% of TDCG as clinically impaired in emotional symptoms. In the conduct problems subscale, 50% of the D + ADHD-CG were identified in the clinical range, while only 3% of DG and 0% of TDCG were classified as clinically impaired. In the total scale, again more than 60% of the D + ADHD-C group was reported by teachers to be clinically impaired compared to

5% of DG and 0% of TDCG. Finally, in the inattention-hyperactivity subscale, 100% of the D + ADHD-CG group were identified by teachers as clinically impaired, whereas only 20% of DG were in the clinical range.

In relation to peer problems and prosocial behaviors, the results of the ANCOVAs did not show any differences between groups. Nevertheless, in peer problems, around 25% of adolescents in the D + ADHD-CG group were identified as clinically elevated by their teachers, whereas the parents identified around 15% in peer problems in the DG and 10% in the TDCG groups (see Table 5). Additionally, the teachers reported slightly more adolescents with less prosocial behaviors in the D + ADHD-CG group (10%) than in the other groups (6% in DG and 0% in TDCG).

4. Discussion

To our knowledge, this study is the first to examine internalizing and externalizing problems in Spanish adolescents with dyslexia, with and without ADHD, using different sources of information such as self-reports and the ratings from the parents and teachers.

In general, both the self-reports from the adolescents themselves and the parents and teachers reported that Spanish adolescents in the two groups with reading difficulties (DG and D + ADHD-CG) obtained higher mean values of internalizing (e.g., state anxiety, depression, emotional problems), externalizing (e.g., conduct problems, inattention-hyperactivity), and total problems than the comparison group, with a higher number of adolescents above the clinical cut-off. In addition, we confirmed that the sample size was adequate and that the power of the significant results was adequate (range 0.80 to 0.83) by using G*Power 3 [55]. Our results are consistent with those in previous studies showing dyslexia as a risk condition for internalizing and externalizing problems [11,13–16,18,19,21,22,24,25,34–40], especially during adolescence [31,32].

One aspect that deserves to be highlighted from our findings is that adolescents in the D + ADHD-CG group presented the greatest internalizing and externalizing problems according to the ratings of the parents and teachers, since, as concluded in the review of previous studies, comorbidity with ADHD is one of the main risk factors [31]. However, our findings with the adolescent self-reporting measures failed to show differences between the two groups with reading difficulties, with and without associated ADHD (GD and D + ADHD-CG). This lack of differences between the two groups is possibly due to strong evidence that a substantial proportion of students with attention-deficit hyperactivity disorder (ADHD) tend to make more positive assessments of their own abilities relative to other external assessments. That is, children and adolescents with ADHD appear to exhibit a self-enhancement bias, being unaware of their thinking patterns, feelings, and behaviors, so their self-reports are often at variance with the assessment of their parents and teachers of them, even with objective evaluations. This positive self-assessment may persist into adulthood [56–58]. Although these discrepancies between self-reports and parent and teacher ratings may be considered as measurement errors or informant bias [59], they may also reflect the true differences related to the environment (e.g., home and school) and/or differences in the informant's knowledge and experiences [60–64].

Our results should be interpreted in light of some of the limitations of the present study. A first limitation concerns the age range of the participants. Our sample was limited to early adolescence (13–15 years), so further research should investigate in depth the development of mental health problems in older adolescents. Longitudinal studies would allow for the detection of early signs of emotional and behavioral problems as well as the possible risk and protective factors for these problems and their progression through the life cycle. A second limitation was the absence of an ADHD group without a reading disability. Comparing this group with an ADHD group without dyslexia would allow us to better understand the impact of ADHD on internalizing and externalizing symptoms.

There are several implications for the practice of our findings. Our results confirm that the presence of dyslexia increases the risk of experiencing mental health problems (anxiety and depression) as well as the presence of internalizing and externalizing problems. Some

researchers [12,13] have highlighted that most interventions tend to focus on academic domains, not paying attention to internalizing and externalizing problems. Given that academic progress, emotional well-being, and mental health are intimately related [12,19,65], the presence of mental health problems should be promptly recognized and treated in combination with academic problems, especially in school contexts [66,67] due to several reasons: (a) adolescents spend a large number of hours per day in schools; (b) mental health problems can be normalized to a greater extent due to the number of students; and (c) they allow for easy access to teachers and families who can participate in the implementation of interventions. Recent reviews [65–67] have confirmed the effectiveness that different psychoeducational interventions, many of which employ cognitive-behavioral techniques, have in reducing the risk and/or symptomatology of anxiety and depression in adolescents. For example, the solution focused behavior therapy program [68,69] focuses on enhancing the behavioral and social-emotional functioning of students with reading difficulties and/or ADHD as well as their academic achievement. In the same vein, other studies [70,71] have confirmed the effectiveness of combined programs on reading and anxiety, both in terms of improving reading difficulties and comprehension as well as reducing anxiety symptoms.

5. Conclusions

In summary, interventions aimed at students with learning difficulties such as dyslexia should address both academic problems and their mental health and/or socio-emotional and behavioral problems, in order to provide them with an educational response more appropriate to their needs. Moreover, if these combined interventions are developed in the early grades, they could further reduce both the academic difficulties and internalizing and externalizing problems of adolescents.

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2.5.3.- Estudio 3

Morte-Soriano, M.-R., & Soriano-Ferrer, M. (under review). Parenting Stress and Parenting Styles in Families with Adolescents with Dyslexia, with and without attention-deficit hyperactivity disorder. *Psychiatry International*

Article

Parental Stress and Parenting Styles in Families with Adolescents with Dyslexia, with and without attention-deficit hyperactivity disorder

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Abstract: Research has shown that dyslexia and ADHD often tend to co-occur. Parents of children diagnosed with dyslexia or ADHD exhibit greater parental stress and, as a consequence, are prone to employing more dysfunctional educational strategies. Therefore, the main objective of this study was to examine parental stress and parenting styles in 95 families of adolescents with dyslexia (DG), comorbid dyslexia + attention deficit hyperactivity disorder, combined subtype (D+ADHD-CG), and a comparison group with typical development (TDCG). Parents completed parental stress and parenting style questionnaires. Results show that the D+ADHD-CG scored higher on parental distress, dysfunctional parent-child interactions, difficult child, and total stress, compared to the other two groups, DG and TDCG. In addition, the DG scored higher than the TDCG on all the subscales. In relation to parenting styles, the results show that parents in the DG and D+ADHD-CG used more dysfunctional parenting strategies (e.g., over-reactivity) than TDCG parents. In conclusion, our findings indicate that parents of adolescents with dyslexia and dyslexia plus ADHD-C experienced more stress and used more inappropriate parenting strategies than parents of comparison adolescents. Therefore, these findings have implications for educational professionals who are planning and developing interventions.

Keywords: Dyslexia; attention-deficit hyperactivity disorder; parental stress; parenting style

1. Introduction

Parenthood is an enriching experience, both socially and psychologically, and it is fundamental in the socialization of children [1, 2]. However, from the birth of their child, parents experience a number of stressors related to the transition to parenthood, as they perceive that the demands of parenting exceed their available physical, economic, and emotional resources to manage or meet these demands [3]. Parents have to face new challenges and take on many responsibilities in order to raise their children to become competent and functional individuals in society by using proactive or reactive parental disciplinary strategies [4]. Therefore, when parents are unable to cope adequately with these new parenting demands for a variety of reasons, such as their own characteristics, socio-demographic factors, or the characteristics of their children, they may develop parental stress [5, 6]. There is evidence that parental stress is often associated with dysfunctional parental discipline characterized by criticism, hostility, and low emotional warmth, which, in turn, influences the development and maintenance of behavioral problems in children [6–8]. In addition, raising a child with a neurodevelopmental disorder (i.e., dyslexia, attention deficit hyperactivity disorder) can be more stressful than raising typically developing children, triggering intense and problematic emotions that influence and modulate the parents' relationship with their children [9–12].

Specific learning difficulties such as dyslexia, compared to other neurodevelopmental disorders, make up an invisible and apparently benign problem that is not diagnosed

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until the child experiences difficulties in school that are not present in a child with normal intelligence whose cognitive deficits are hidden [10]. This appearance of normality may generate false hopes and unrealistic expectations in parents about their child's academic performance, which could in turn increase stress and family problems, as noted by Dyson [10]. In fact, findings from most research on parental stress and family functioning have suggested a significant relationship between specific learning difficulties and a troubled family climate, increasing daily life challenges and needs, especially related to academic performance and school problems [10, 13-15]. Although studies on the stress of parents of children with dyslexia are scarce, the results are quite consistent, finding higher levels of parental stress on different scales such as parental distress and dysfunctional parent-child interaction, and even the perception that their child with dyslexia is more difficult to educate [9, 12, 14].

Specifically, according to the study by Bonifacci et al. [15] using the Parental Stress Index (PSI), mothers of elementary school children with dyslexia (9-13 years) show higher levels of stress, especially in parent-child interactions, and they report greater difficulties in daily life related to the needs of their child with dyslexia. Snowling et al [16] observed that approximately 74% of parents of children in early adolescence (12-13 years) with a family history of dyslexia reported that their child's difficulties had a mild to severe impact on family life, and that mothers of children with dyslexia had higher levels of stress. Similarly, Carotenuto et al. [17], also using the Parental Stress Index (PSI), found that mothers of elementary school children with dyslexia (8-11 years old) reported higher rates of parental stress and difficulty on all the subscales of the PSI. That is, they found higher levels of parental distress, Dysfunctional Parent-Child Interaction, and the "Difficult Child" scale (which measures parents' perceptions of the child's behavior with respect to behaviors that tend to make parenting easier or more difficult). However, we are not aware of any studies that have analyzed the parenting styles of parents of children and adolescents with dyslexia.

In addition, specific learning disorders such as dyslexia and attention deficit hyperactivity disorder (ADHD) show a high association, around 20-40% in the excellent review by Hedren et al. [18], possibly due to high executive function demands in reading that pose a great challenge for students with ADHD [19-24]. Specifically, Darweesh et al. [20] found an association of 18%, whereas the study by Visser et al. [25] points to a comorbidity of 28%. The wide range of associations between dyslexia and ADHD may be due to different reasons, such as the diagnostic criteria and instruments used or the transparency of the orthographic system, among others. ADHD is characterized by the presence of elevated symptoms of inattention, impulsivity, and hyperactivity, which are often associated with school difficulties and increased problems in family dynamics [26].

Theule et al. [27] carried out a meta-analysis of 44 studies that mainly used the Parental Stress Index (PSI). The results confirm that parents of children younger than 12 years old with ADHD experience much higher levels of parental stress than parents of control families, with higher levels of stress in parents of boys, when the severity of the symptoms increases, and when there is an association with behavioral problems.

Weiner et al [28] analyzed parental stress in parents of 13 to 18-year-old adolescents with ADHD. Their results show that parents of adolescents with ADHD reported more stress than parents of adolescents without ADHD, especially with respect to their children's challenging behaviors, as well as role restrictions, feelings of social alienation, conflict with their partner, feelings of guilt and incompetence, and the relationship with their children. In addition, Weinberger, Gardner, and Gerdes [29] found that parental stress levels were higher in the hyperactivity-impulsivity subgroups and in the combined subtype ADHD subgroup, even adopting more negative parental disciplinary behaviors than in the inattentive ADHD subgroup.

Likewise, parental stress is frequently associated with dysfunctional parental disciplinary practices, which are characterized by increased criticism, hostility, and low emotional warmth and, as a consequence, predicts the development of comorbid behavioral

problems in adolescence in children with ADHD [30, 31]. In this regard, several studies that have analyzed the parenting styles of parents of children with ADHD have shown that they use dysfunctional parenting strategies, usually with a high emotional charge. They are more authoritarian and react with greater irritability and frustration, they make more negative comments about the behavior and performance of their children in a more serious tone of voice, and they set strict limits without giving explanations, especially in the presence of oppositional problems [32–34]. In the study carried out in Spain by Miranda et al. [33], which compared the educational styles of 114 families of ADHD children (75% combined subtype) and 53 families without ADHD, the results confirmed that mothers use severe discipline strategies to a greater extent, although without a greater use of permissiveness or verbosity. However, Keown and Woodward's [35] study of 33 families with preschool ADHD children (aged 3–5 years) indicates that parents employ more permissive discipline strategies, less efficient parental coping, lower rates of father-child communication, and less synchronous mother-child interactions. In addition, the subtype with combined ADHD poses greater educational challenges for families, given that these children are more impulsive, less tolerant to environmental changes, and moodier, and so parents feel less competent as parents, more depressed, less emotionally attached to their children, and more overwhelmed by parenting [33, 36].

In general, research has shown that parents of children diagnosed with dyslexia or ADHD exhibited greater parental stress and, thus, were prone to employing more dysfunctional educational strategies. A study by Bonifacci et al. [37] comparing parental stress in 38 families of children with dyslexia and 27 families with ADHD showed that families with ADHD experienced much higher levels of stress than families of children with dyslexia. Thus, given that dyslexia and ADHD tend to co-occur frequently, parents of adolescents with both disorders (Dyslexia + ADHD) may experience a higher risk of parental stress and dysfunctional parenting styles than parents of adolescents with dyslexia alone. Therefore, the main objective of this study was to examine the parental stress and parenting styles of parents of adolescent children with dyslexia, with and without comorbid, combined subtype ADHD.

2. Materials and Methods

2.1. Participants

This study involved 95 families with adolescents from 12 to 15 years old; 34 families had adolescents with Dyslexia (DG), 28 families had adolescents with Dyslexia+Attention Deficit Hyperactivity Disorder, combined subtype (D+ADHD-CG), and 33 families had typically developing children (TDCG). At the time of the study, all the participants came from 13 secondary schools from the Valencian Community (Spain). All the participants were Caucasian, and their primary language was Spanish. The specific criteria used in the diagnosis of the three subgroups of adolescents are described elsewhere [38].

Dyslexia group (DG). Thirty-four families with an adolescent child with dyslexia (mean age=12 years and 10 months, SD= 0 year and 11 months; 79.4% male) participated. DSM-5-TR criteria [26] were used for the diagnosis of adolescents with dyslexia: a) a reading achievement score at or below the 25th percentile on word and/or pseudoword accuracy and/or speed on the Standardized Reading Skills Battery PROLEC-SE-R [39]; b) scores at or above 80 on an intelligence test [40]; and (c) exclusion criteria (i.e. absence of evidence or history of neurological damage, hearing or visual impairments,...).

Dyslexia + attention deficit hyperactivity disorder group (D+ADHD-CG). Twenty-eight families with an adolescent child (mean age = 13 years and 2 months, SD = 1 year and 2 months; 75% male) who met both the dyslexia criteria and the clinical diagnostic criteria for combined subtype ADHD, according to DSM-5-TR criteria [26], participated. Mental Health Services had previously diagnosed the ADHD combined subtype, but the diagnosis was confirmed prior to their participation in this study. In summary, all the adolescents presented: a) six or more symptoms of inattention and six or more symptoms

of hyperactivity-impulsivity, according to parent and teacher assessments; b) ADHD symptoms were persistent for more than 6 months; c) onset of symptoms took place before the age of 12 years; d) ADHD symptoms interfered with the subject's daily academic and/or social functioning; e) exclusion criteria (i.e., IQ below 80, autism, psychosis, epilepsy, or any other neurological or genetic disease).

Typical development comparison group (TDCG). Thirty-three families with a typically developing adolescent child participated (mean age=12 years and 8 months, SD= 0 year and 9 months; 75.8% male). All the adolescents attended regular classrooms and had an average or above average academic performance in all areas, according to teacher reports, and they had a reading score $\geq$ 50th percentile on the Standardized Reading Skills Battery PROLEC-SE-R [39] and were not receiving educational services outside the regular classroom.

Demographic characteristics of the families are presented in Table 1. There were no statistically significant differences between the three groups in the age of the parents or in their marital status. Most of the parents were married or living together (97.1% for DG, 92.9% for D+ADHD-CG, and 90.9% for TDCG). With regard to their occupations, most of the fathers had a paid job in the three groups (100% for DG and TDCG) and only 17.5% of the parents had no job in the D+ADHD-CG, whereas in the case of mothers, only around 23.5% for DG and 24.2% for TDCG did not have a paid job. Fathers' and mothers' occupations were distributed in four levels of skills, according to the International Labor Organization [41]. Statistically significant differences were found in the mother's occupation, $\chi^2_{(8)}=28.72$, $p<.001$, and in the father's occupation, $\chi^2_{(8)}=24.78$, $p<.002$, and so these variables were used as covariates in the subsequent analyses. In all the groups, as usual, the instruments for fathers were completed mainly by mothers (between 89%-95%). Both parents completed only about 7%, and a small number of the instruments were completed by fathers only (between 0%-2.5%). As compensation, families were given a report about the results in the different domains analyzed.

Table 1. Descriptive characteristics of families.

	DG (N=34)	D+ADHD- CG (N=28)	TDCG (N=33)	<i>Statistics</i>		
	M (SD)	M (SD)	M (SD)	<i>F</i> (2,92)	<i>p</i>	η^2
<i>Age mother</i>	42.2 (4.4)	44.9 (5.1)	44.5 (5.3)	2.91	.06	.06
<i>Age father</i>	46.3 (5.1)	47.4 (4.5)	47.6 (4.9)	.76	.29	.02
<i>Marital Status</i>	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>X</i> ₍₂₎ ²	<i>p</i>	
<i>Married/living together</i>	33 (97.1)	26 (92.9)	30 (90.9)	1.12	.57	
<i>Alone/widower/divorced</i>	1 (2.9)	2 (7.1)	3 (9.1)			
<i>Mother's occupation^a</i>	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>X</i> ₍₆₎ ²	<i>p</i>	
<i>Without paid job</i>	8 (23.5)	0 (0)	8 (24.2)	28.72	.001	
<i>Skill level 1</i>	17 (50)	8 (28.6)	14 (42.4)			
<i>Skill level 2</i>	7 (20.6)	20 (71.4)	6 (18.2)			
<i>Skill level 3</i>	2 (5.9)	0 (0)	5 (15.2)			
<i>Skill level 4</i>	0 (0)	0 (0)	0 (0)			
<i>Father's occupation^a</i>	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>X</i> ₍₈₎ ²	<i>p</i>	
<i>Without paid job</i>	0 (0)	5 (17.5)	0 (0)	24.78	.002	
<i>Skill level 1</i>	3 (8.8)	0 (0)	5 (15.2)			
<i>Skill level 2</i>	24 (70.6)	23 (82.1)	19 (57.6)			
<i>Skill level 3</i>	6 (17.6)	0 (0)	7 (21.2)			
<i>Skill level 4</i>	1 (2.9)	0 (0)	2 (6.1)			

Note. Adapted from a previous study developed by Morte-Soriano and Soriano-Ferrer [38]

^a Based on the International Standard Classification of Occupations [41].

2.2. Measures

Demographic information questionnaire. The parents of the adolescents provided information about their age, sex, and marital status. The parents' jobs were classified in four levels of skills, according to the international classification [41], and this classification was used as an indicator of the families' socioeconomic status.

Parental stress. We used the Spanish version of the Parenting Stress Index-Short Form [PSI-SF; 42, 43], which includes 36 items corresponding to three subscales (12 items per scale): (a) Parental Distress (PD), which measures the distress experienced by parents due to personal factors, such as depression or conflict with a partner, or life restrictions due to the demands of their parental role; (b) Parent-Child Dysfunctional Interaction (PCDI), which assesses the perception that the child does not respond to parental expectations; (c) Difficult Child (DC), which evaluates the ease or difficulty of parenting based on their behaviors. The sum of the 36 items provides a measure of total stress (TS). Higher scores on the different subscales indicate higher levels of parental stress. The PSI-SF shows high internal consistency (Cronbach's alpha): .84 (PCDI), .82 (PD /DC), and .90 for Total Stress.

Parenting styles. The Parenting Scale [44], which consists of 30 items about common parenting behaviors, was used to measure maternal discipline strategies. The scale is composed of three subscales: a) Laxity or permissive discipline, which indicates few demands and little control over children, yielding to their demands or reinforcing their inappropriate behaviors; b) Over-reactivity, where parents show reactions of excessive frustration, irritability, and anger; c) Verbosity, where parents use excessive threats and recriminations, despite their lack of effectiveness. Lower scores indicate a high probability of using an effective disciplinary strategy, whereas higher scores indicate a high probability of using ineffective disciplinary strategies. The scale shows good reliability and internal consistency (Cronbach's alpha coefficient = .84). Its factor structure is consistent with research on parenting styles [45].

2.3. Procedure

The study respected all the principles outlined in the current legislation on research investigations and was approved by the Research Ethics Committee of the University of Valencia, which is regulated by Ethical Principles for Medical Research Involving Human Subjects and aligns with the Declaration of Helsinki. For example, prior to commencing any study procedures, parents' informed consent was obtained. Later, a parent of each participant was asked to complete the respective measure at their convenience and either return it by mail or send it by email to the second author.

Recruitment of families for this study occurred by contacting relevant parent associations (e.g., associations for parents of children with dyslexia and ADHD) and sharing study information with members, and by contacting school psychologists from different schools throughout the region to share the same study information. Participants in the TD group were recruited from the same schools as the participants in the DG and D+ADHD-CG. The criteria described in the participants section were used to choose eligible participants for the study. As compensation, families were given a report about the results in the different domains analyzed.

2.4. Statistical analysis

Data were analyzed using SPSS version 24 for Windows. First, descriptive statistics were used to describe the characteristics of the participants (see Table 1). Normality was assessed by investigating skewness and kurtosis. There are some skewness and kurtosis value settings that have been considered normal by previous researchers. Absolute values of ± 2.0 for skewness and ± 7.0 for kurtosis have been recommended and could be interpreted as thresholds of acceptability, with any value within this range being considered normal [46-49]. Therefore, a between-groups ANOVA for continuous variables and a chi-square analysis for categorical variables were performed. To compare parental stress and parenting styles between groups, a multivariate analysis of covariance (MANCOVA) was

performed with parents' occupations as covariates (mothers and fathers), due to statistically significant differences between groups (see participants section), and the group of origin (DG, D+ADHD-CG, TDCG) as a grouping factor. Next, a between-groups analysis of covariance (ANCOVA) was conducted for each measure, with parents' occupations as covariates (mothers and fathers). To control for multiple comparisons, a Bonferroni correction (adjusted $\alpha = .05/8 = .006$) was applied to determine the significance levels. We report effect sizes using the partial eta squared statistic (η_p^2), with values between 0.01 and 0.10 considered small effect sizes, values between 0.10 and 0.49 considered medium, and values above 0.50 considered large effect sizes. Subsequently, the Bonferroni *post hoc* test was applied to check the differences between pairs of groups, due to the fact that the Bonferroni test is a conservative *post hoc* test.

3. Results

The MANCOVA performed with fathers' and mothers' occupations as covariates showed significant main effects by group, Wilks's Lambda (Λ) = .073, $F_{(12, 170)} = 38.193$, $p < .001$, $\eta_p^2 = .72$, with a large effect size.

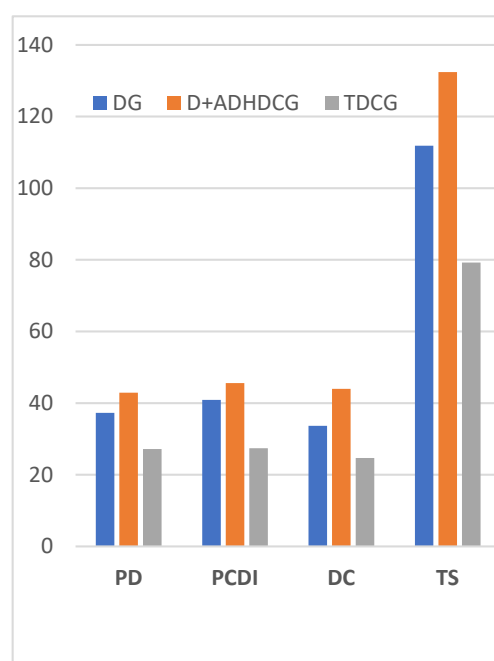
With regard to parental stress (see Table 2), ANCOVAs showed differences between the groups on parental distress, $F_{(2, 90)} = 66.752$, $p < .001$, $\eta_p^2 = .59$, parent-child dysfunctional interaction, $F_{(2, 90)} = 130.081$, $p < .001$, $\eta_p^2 = .74$, difficult child, $F_{(2, 90)} = 184.227$, $p < .001$, $\eta_p^2 = .80$, and total stress, $F_{(2, 90)} = 212.858$, $p < .001$, $\eta_p^2 = .82$, with large effect sizes in all cases (see Table 2).

Post hoc tests showed that parents of adolescents with D+ADHD-C experienced higher levels of stress on all the subscales (i.e. parental distress, parent-child dysfunctional interaction, difficult child, and total stress), compared to the other two groups, DG and TDCG. Moreover, post hoc tests showed that parents of the DG also scored significantly higher on all the subscales than the TDCG (see Figure 1).

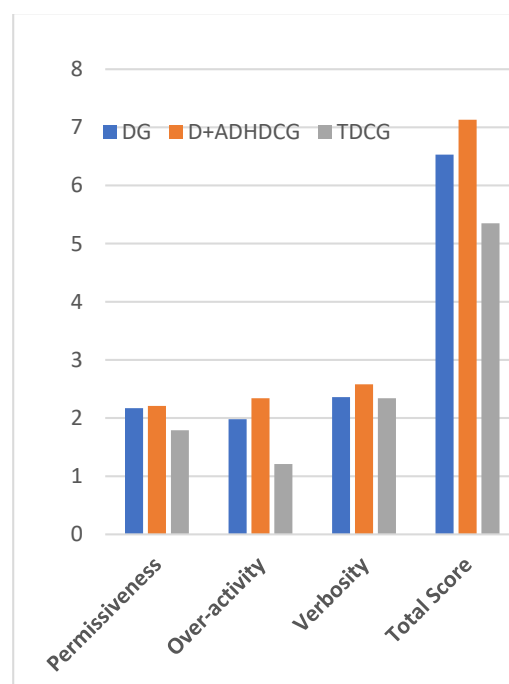
Table 2. Comparison of parents' ratings of parental stress.

	DG (N=34)		D+ADHD- CG (N=28)		TDCG (N=33)		$F_{(2, 90)}$	p	η_p^2
	Mean	SD	Mean	SD	Mean	SD			
PSI									
PD	37.29	4.30	42.89	6.30	27.18	5.34	66.75	.001	.59
PCDI	40.88	5.75	45.57	3.64	27.39	5.75	130.08	.001	.74
DC	33.68	3.81	43.96	3.10	24.67	3.73	184.23	.001	.80
T S	111.85	9.30	132.43	8.69	79.24	10.45	212.85	.001	.82

Note: PD= Parental Distress; PCDI= Parent-Child Dysfunctional Interaction; DC= Difficult Child; TS= total Scale

Figure 1.- Means for parental stress in each group.

Note: PD= Parental Distress; PCDI= Parent-Child Dysfunctional Interaction; DC= Difficult Child; TS= total Scale

Figure 2.- Means for parenting styles in each group.

In relation to parenting styles (see Table 3), ANCOVAs found statistically significant differences between parents of the three groups on the permissiveness subscale, $F_{(2, 90)} = 14.247$, $p < .001$, $\eta p^2 = .24$, with a medium effect size. Post hoc tests showed that parents of adolescents with D+ADHD-CG scored higher than the other groups (DG and TDCG) on permissiveness. No significant differences were found between parents in the DG and TDCG.

Table 3. Comparison of parents' ratings of parenting styles.

Parenting Scale	DG (N=34)		D+ADHD- CG (N=28)		TDCG (N=33)		$F_{(2, 90)}$	p	ηp^2
	Mean	SD	Mean	SD	Mean	SD			
Laxness/ Permissive- ness	2.17	.31	2.21	.24	1.79	.40	14.25	.001	.24
Over-reactivity	1.98	.17	2.34	.52	1.21	.33	71.62	.001	.61
Verbosity	2.36	.40	2.58	.60	2.34	.16	3.36	.04	.06
Total Score	6.53	.54	7.13	1.13	5.35	.57	38.68	.001	.46

With regard to the overreaction subscale, significant differences were also found between the groups, $F_{(2, 90)} = 71.621$, $p < .001$, $\eta p^2 = .73$, with a large effect size, and on the total dysfunctional strategies scale, $F_{(2, 90)} = 38.667$, $p < .001$, $\eta p^2 = .46$, with a medium effect size,

there were also differences between the groups. The results of post hoc tests on both subscales indicated that parents of adolescents with D+ADHD-CG use dysfunctional parenting strategies to a greater extent than parents in the other groups (DG and TDCG). In addition, differences were found between the parents of the DG and those of the TDCG, with the parents of the DG using more dysfunctional strategies such as overreaction and total score (see Figure 2).

Finally, in relation to the use of verbosity, there were no significant differences between the parents of the groups of adolescents.

4. Discussion

The aim of the research was to analyze parental stress levels and parenting styles employed by parents of adolescents with dyslexia, dyslexia+ADHD combined subtype, and typical development. Our data confirmed that parents of adolescents with dyslexia experience higher levels of stress overall. In addition, they experience higher levels of parental distress and more problematic interactions, and they perceive their child with dyslexia as more difficult to parent, compared to parents of typically developing adolescents. This result has been previously confirmed by other studies that have also found higher levels of parental stress in families of children and adolescents with dyslexia [9, 12, 14–16].

Moreover, the comorbid presence of ADHD combined subtype and dyslexia seems to present an additional risk for families, given that parents of adolescents with D+ADHD-CG experienced the highest levels of parental stress in all domains of the parental stress index. That is, they experienced higher levels of parental distress and more complicated interactions with their adolescent children, and they perceived their children with dyslexia and ADHD as much more difficult to discipline. Thus, parents of adolescents with dyslexia +ADHD combined subtype not only outperformed families of typically developing adolescents in terms of stress, but also families with adolescent children with dyslexia. These results support previous findings pointing to more stress in families of children and adolescents with ADHD combined subtype [27–29], as well as the findings from the only comparative study of families with children with dyslexia and families with children with ADHD, carried out by Bonifacci et al [37]. The reasons parents of adolescents with dyslexia +ADHD combined subtype experience high levels of stress probably have to do with the fact that adolescence is a complicated developmental stage and that the adolescents whose parents participated in this study were those who experienced the highest internalizing and externalizing problems, according to parent and teacher estimates [38]. Therefore parents of these adolescents with academic and behavioral problems may have been overwhelmed in their educational role and suffered from parental burnout [36].

Another aspect that should be highlighted is that parents of the group of adolescents in the comorbid group with dyslexia and ADHD combined subtype use dysfunctional parenting strategies more frequently than parents of the other two groups of adolescents, that is, those with dyslexia and those with typical development. Specifically, parents of adolescents with dyslexia + ADHD more frequently employ permissiveness and authoritarian educational strategies such as overreaction, possibly because they have to cope with both the academic problems of dyslexia and the difficulties in managing the behavioral characteristics associated with ADHD, especially in the adolescent stage when academic difficulties may have become more acute. Previous studies had already confirmed the use of more inadequate parenting strategies in families of children with ADHD, especially in the combined subtype and when there are associated behavioral problems [32–34]. However, a novel result is that parents of adolescents with dyslexia also employ dysfunctional educational practices, especially excessive reactivity and authoritarianism, to a greater extent than parents of adolescents with typical development, possibly because they have to cope with poor academic progress, a greater need for help with homework, and seeking appropriate teaching or reading support in the adolescent stage. One aspect to take into account is that neither of the clinical groups (dyslexia and dyslexia plus combined subtype

ADHD) employs a different verbiage style in the education of their children, possibly because adolescents' inappropriate behaviors or poor performance could be reinforced by their parents' verbosity, with no immediate negative consequences for the adolescents. Therefore, parents of adolescents would not employ this style because of its ineffectiveness in handling their children's disciplinary challenges [44].

Our results should be interpreted in light of some limitations of the present study. A first limitation is that only the mothers of the adolescent participants completed the measures for the parents, and all the measures used were self-reports. Our sample is limited to early adolescence (13-15 years), and future research should include older adolescents. A third limitation is the absence of an ADHD group without reading problems. Comparison with this ADHD group without dyslexia would allow us to better understand the impact of ADHD on parental stress and parenting styles in families with an adolescent with dyslexia.

Finally, our findings have several practical implications for improving the family environment. Different review papers on intervening in the problems faced by families of children with learning disabilities and ADHD [50, 51] point to the effectiveness of different parenting intervention approaches ranging from behavioral interventions, cognitive-behavioral interventions, assertiveness and problem-solving training, individual and group counseling, emotion regulation, stress management, mindfulness, and resilience training, among others. Some widely known programs, such as Riding the Rapids [52, 53], the Triple P-Positive Parenting Program [54], Incredible Years [55], and SMART-3RP [56], have been used with families of children with learning disabilities and/or ADHD. The Sanders et al. [57] systematic review and meta-analysis of 101 studies published over 33 years showed that Triple P has positive short- and long-term effects on social, emotional, and behavioral achievements in children, as well as on parenting practices, parenting satisfaction and efficacy, parental adjustment, and the parental relationship. Furthermore, Aghebati et al. [58] applied the Triple P program in 120-minute sessions for 5 weeks to 30 mothers of children with ADHD (6-10 years). The results showed that the mothers improved their parenting style and mother-child relationship while decreasing their depressive symptoms, anxiety, and stress. An adaptation and virtual application of the SMART-3RP program for parents of children with learning and attention difficulties [59] also demonstrated its efficacy in improving parental distress, resilience, and stress coping, all of which were maintained three months later. Likewise, Mindfulness training, with or without cognitive therapy [60, 61], has shown its efficacy in parental stress management and parenting styles.

5. Conclusions

Our findings indicate that parental stress and dysfunctional parenting strategies in parents of adolescents in the DG and D+ADHD-C groups should be recognized and treated promptly because parental stress has been associated with the presence of negative parent-adolescent interactions in families, the development of more dysfunctional parenting styles, and even inadequate implementation of treatments. Therefore, it is necessary to develop interventions in the family context to improve family well-being and reduce or eliminate maladaptive family interactions, facilitating the construction of effective family relationships. Finally, more longitudinal studies are needed to detect early signs of family problems, as well as possible risk and protective factors for these problems.

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Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Committee of University of Valencia (protocol code H1518525013984 and date of approval March 2nd, 2018).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data is available on reasonable request from the corresponding author.

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Conflicts of Interest: The authors declare no conflicts of interest

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2.5.4.- Estudio 4

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Psychoeducational Challenges in Spanish Children With Dyslexia and Their Parents' Stress During the COVID-19 Pandemic

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Background: Research during 2020 has been rapidly attending to the impact of COVID-19 on various dimensions of wellbeing (e.g., physical, psychological, lifestyle and routines) on adults and children around the world. However, less attention has focused on the psychoeducational impact on children and their families. To our knowledge, no currently available studies have looked specifically at the impact of COVID-19 on students with dyslexia and their families. Research on this topic is needed to offer greater support for this population of students and their families.

Objective: The main objective of this paper is to examine the psychoeducational impact of the required COVID-19 quarantine in Spain among children with dyslexia and their families.

Method: A sample of 32 children with dyslexia and their mothers participated in this study.

Measures: Children and adolescents with dyslexia and their mother completed several measures before the required national quarantine in Spain and again during the quarantine. Children completed measures of depression, state anxiety, reading activity, and reading motivation. Mothers provided demographic information and completed measures related to students' emotional and behavioral difficulties as well as parenting stress, parental distress, and a questionnaire about educational problems during quarantine.

Results: Major findings showed that during quarantine, children with dyslexia had increased levels of depression and anxiety symptoms, and parents perceived their children as having more emotional symptoms, hyperactivity-inattention, and conduct problems. During quarantine, children and adolescents with dyslexia also showed less reading activity and less reading motivation. Parents also reported significantly more stress, during quarantine compared to pre-quarantine conditions. Some demographic and psychological variables predicted children's state anxiety as well parental stress. The questionnaire related to impacts of quarantine also revealed several important findings. For example, nearly all parents of children with dyslexia reported (a) difficulties

in establishing study routines, (b) that the quarantine negatively affected their child's learning, and (c) that they did not receive sufficient help from teachers on how to support their child's learning. Additionally, the vast majority of the parents were very worried about the child's learning and school success, the child's motivation and interest in reading, the child's peer relations, and the professional skills of the child's teacher.

Conclusion: This study offers a preliminary investigation into this topic and elucidates several psychoeducational challenges that children with dyslexia and their families have experienced during the quarantine in Spain. Study findings highlight the need to provide immediate support for children with dyslexia and emphasizes the importance of developing prevention programs to mitigate any future negative impacts of COVID-19 on children with dyslexia and their parents.

Keywords: dyslexia, COVID-19, psychoeducational impact, parent stress, quarantine

INTRODUCTION

Dyslexia is a neurodevelopmental disorder of neurological origin and characterized by impaired reading acquisition despite the presence of adequate intelligence, education, and socioeconomic background to learn to read (American Psychiatric Association [APA], 2014; Adrián-Ventura et al., 2020). Dyslexia impacts approximately 6% of elementary and secondary students in Spain (Jiménez et al., 2009; González et al., 2010) and an estimated 5–15% of the global population (American Psychiatric Association [APA], 2014). The first decades of research in dyslexia were mainly devoted to the cognitive and biological underpinning of the disorder (Vellutino et al., 2004; Soriano-Ferrer and Piedra-Martínez, 2017). Compared to students with average to above average reading skills, accumulated evidence suggests that students with dyslexia can show a range of reading-related (e.g., pseudoword reading, spelling, vocabulary) and cognitive (e.g., rapid naming, verbal, working memory) difficulties (Soriano-Ferrer and Miranda, 2010; Kudo et al., 2015; Soriano-Ferrer et al., 2016; Morte-Soriano et al., 2020).

In recent years, a growing body of evidence suggests that children and adolescents with dyslexia also show increased risk of experiencing mental health difficulties (Swanson and Vaughn, 2016; Heiman and Olenik-Shemesh, 2020). The repeated experiences of failure faced by students with dyslexia appear to increase their vulnerability to experiencing internalized disorders (e.g., anxiety and depression) and lower opinions of their academic competence. Studies examining psychological wellbeing for those with a learning disability (LD) offer relevant data because dyslexia is the most common LD. For instance, the meta-analysis by Nelson and Harwood (2011b) revealed that around 70% of students with a LD experience greater anxiety symptoms than students without a LD, and there were no differences between self-reports and parent reports of anxiety. Also, a study by Panicker and Chelliah (2016) revealed that a relatively higher percentage of students with a specific LD had severe stress (16%), severe anxiety (23%), and/or severe depression (14%). Nelson and Harwood (2011a) also completed a meta-analysis to understand depression among students with a LD and found higher scores

on measures of depression than students' peers without a LD, which was true regardless of who reported depression-related symptoms (i.e., self-report, parent, or teacher). Similarly, the meta-analysis by Francis et al. (2019) found that poor readers were at moderate risk (at statistically significant levels) for experiencing anxiety and depression, and Mammarella et al. (2016) found that students with dyslexia have worse symptoms of depression than individuals with non-verbal learning disabilities.

Some studies (e.g., Lee and Zentall, 2012; Soriano-Ferrer et al., 2014; Wolters et al., 2014; Soriano-Ferrer and Morte-Soriano, 2017) have also looked specifically at the psychoeducational wellbeing of children with dyslexia and found that this population of students have more negative self-perceptions as readers (e.g., feeling less competent in reading, having more difficulty, and not liking reading), have lower motivation to read (e.g., they more commonly avoid reading activities) as assessed by self-reports or by teachers' reports, and demonstrate lower utility of reading. Thus, students with dyslexia read less for enjoyment and engage less in reading activities. Lee and Zentall (2017) also found that students with dyslexia maintained low reading motivation and decreased their reading for school as they transitioned to middle school.

Dyslexia presents significant challenges for the student and it can also have negative impacts on their parents (Delany, 2017). Mothers, in particular, show higher levels of stress and depression and report significant impacts on family and increased difficulties in everyday life (Bonifacci et al., 2014). Snowling et al. (2007) observed that approximately 74% of parents reported that their child's difficulties had a mild to severe impact on family life and that mothers of children with dyslexia had higher levels of stress and depression. Using the Parental Stress Index (PSI), results of Bonifacci et al. (2014) seem to suggest that the effect on the family system of having a child with dyslexia may be specific to parent-child interactions and on worries regarding the needs of the child with a LD. Also, Carotenuto et al. (2017) found that mothers of children affected by dyslexia reported higher rates of parental stress and difficulty on the PSI according to indexes of Parental Distress, Parent-child Dysfunctional Interaction, and "Difficult Child" (which measures a parent's perceptions of the child's

behavior with respect to behaviors that often make parenting easier or more difficult.

COVID-19 and the Impact of National Quarantines on Children and Their Families

Because of the significant and widespread health threat of the coronavirus (COVID-19) pandemic, many governments worldwide decreed home-based quarantines as an approach to contain the expansion of COVID-19. For example, Spain was in state of alarm from March 14, 2020, until June 21, 2020, with few exceptions (e.g., to purchase essential items such as food, attend health centers, or take a walk close to home). According to the United Nations Educational, Scientific, and Cultural Organization [UNESCO], (2020), school closures caused by the coronavirus pandemic have already affected over 1.5 billion students and their families. The disruption of in-person learning is unprecedented and, as was highlighted in the report of Di Pietro et al. (2020), the move to remote learning environments in numerous countries could have significant and negative impacts on children's academic learning as well as their cognitive and non-cognitive skills.

School closures—and therefore remote learning—creates restricted mobility and social isolation for students and the overall set of circumstances presents major challenges for children and their families' psychological wellbeing (Cachón-Zagalaz et al., 2020; Griffith, 2020; Mazza et al., 2020a,b). Several recent studies have used parent reports about the impact of quarantine on children's or adolescents' mental health. For instance, with a sample from Spain, Erades and Morales (2020) found that 70% of parents reported their children as having at least one negative emotional reaction during the pandemic (e.g., 31% were reported to have sleep problems and 24% had behavioral problems). Gómez-Becerra et al. (2020) indicated that the highest psychological difficulties for Spanish children and adolescents appear to be connected to emotional symptoms, behavioral problems, and overall difficulty. The authors also reported that as the quarantine continues over time, the presence of psychological difficulties generally increase. Within western countries, emotional and behavioral changes in their children were observed by parents in the first weeks of lockdown (Francisco et al., 2020; Orgilés et al., 2020). For example, in the study by Orgilés et al. (2020), 86% of parents from Spain perceived changes in their children's emotional state and behavior during the quarantine (e.g., 77% had difficulty concentrating, 52% experienced significant boredom, 39% experienced irritability, 38% showed restlessness, and 38% had notable nervousness). In another study carried out 7 weeks after lockdown and utilizing parent report, Orgilés et al. (2021) found that 56% of children scored above the clinical cut-off point for anxiety and 26.4% scored above the clinical cut-off for depression.

A few studies over the past months have used self-report measures for children and adolescents. Xie et al. (2020) found higher levels of depression among study participants in China and Duan et al. (2020) found that 23% of respondents from China

suffered from depressive symptoms. Cao et al. (2020) similarly reported higher levels of generalized anxiety in college students from China (0.9% severe, 2.7% moderate, and 21.3% mild anxiety) during the quarantine. Duan et al. (2020) also reported (though not with exact percentages) higher levels of anxiety, with gender differences (i.e., more anxiety in females than in males) and age differences (i.e., more anxiety in adolescents than in children). Moreover, 55% and 36% reported that the pandemic has affected their learning or ability to graduate, respectively. Overall, in the relatively short duration during which researchers have examined impacts of COVID-19, most studies have reported negative psychological effects on children and adolescents who are impacted by national quarantines, and these impacts are occurring across numerous countries around the world (Brooks et al., 2020; Francisco et al., 2020; Liang et al., 2020; Orgilés et al., 2020, 2021).

At the family level, parents are usually the ones who must help their child(ren) to cope with the additional stress and emotional difficulties (e.g., anxiety and symptoms of depression) caused by school closures, remote learning, and children's confinement at home (Brown et al., 2020; Fegert et al., 2020; Halvorsen et al., 2020; Spinelli et al., 2020). Brooks et al. (2020) reviewed 24 studies published between 2004 and 2019 in different countries about the psychological impact of quarantine on adults and concluded that most studies reported negative psychological effects, including post-traumatic stress symptoms, confusion, and anger. The studies reviewed by Brooks et al. (2020) also suggested that longer durations of quarantine generally correspond with worse mental health symptoms. In a study of 3,055 adults from Spain aged 18–88 years, Rodríguez-Rey et al. (2020) concluded that 37% of these participants showed psychological distress due to the COVID-19 pandemic. Likewise, in China 40.4% of youth were prone to psychological distress (Liang et al., 2020).

Indeed, for the vast majority of individuals around the world, the life condition of families suddenly and deeply changed as a result of the COVID-19 pandemic. As one example, during quarantine in the home environment, the educational role of parents has become even much crucial than before. Children often have only their parents to provide support with homework (when necessary) and parents can become the central figure needed to promote a positive learning and developmental experience (Wang et al., 2020). Furthermore, parents of children with pre-existing psychological and behavioral difficulties are reporting problems with managing their children at home over this extended period (Colizzi et al., 2020; Marchetti et al., 2020a). Therefore, dealing with confinement and trying to balance factors such as personal life, professional responsibilities, and the education of one's child(ren) can be a stressful experience (Marchetti et al., 2020a,b; Mazza et al., 2020a,b; Spinelli et al., 2020). The study by Spinelli et al. (2020) in Italy is the only published report to date that explored the effect of COVID-19 on parents' stress. Their results showed that COVID-19 puts parents of children aged 2–14 years old at a higher risk of experiencing individual and dyadic distress during quarantine, potentially impairing their ability to be supportive caregivers. The researchers suggested that the lack of support many children are able to receive in such a difficult moment may be a reason for

their more pronounced psychological symptoms. Furthermore, some studies have shown that prolonged exposure to parental stress can result in another important phenomenon occurring during the pandemic: the so-called *parental related exhaustion*. Parental related exhaustion has been defined as feelings of being overextended and depleted of one's emotional and physical resources (Mikolajczak et al., 2018), which in turn influence psychological well-being of children. Indeed, in their study on parental-related exhaustion during the COVID-19 pandemic, Marchetti et al. (2020b) found that more than 80% of their sample reported high levels of distress and 17% experienced significant parenting-related exhaustion.

Some previous studies (e.g., Cao et al., 2020; Duan et al., 2020; Gómez-Becerra et al., 2020; Orgilés et al., 2020, 2021) have linked mental health problems, both in children and adults, with variables related to COVID-19 (e.g., fear of illness, death, having a family/friend infected, . . .), while other studies (e.g., Mikolajczak et al., 2018; Colizzi et al., 2020; Liang et al., 2020; Marchetti et al., 2020a,b; Spinelli et al., 2020) have related them to socio-demographic characteristics (e.g., having a larger number of children, lacking a domestic partner) or child features (e.g., special needs, externalizing symptoms, ADHD, behavior problems). However, further studies should examine this issue in even greater depth.

Purpose of the Present Study and Research Questions

Despite the important and relatively rapid development of research and reporting on psychological and educational impacts of national quarantine policies resulting from COVID-19, research in this area is still emerging and several gaps exist. For example, research focusing on psychological impacts of children aged approximately 9–14 years is limited and we are not aware of a single study that has specifically evaluated children with dyslexia. Given the research summarized at the beginning of this report, research must begin to carefully examine the impacts of school closures on students with dyslexia because they are already vulnerable to both learning and psychological difficulties. Additionally, there are no known psychoeducational-focused studies that have explored the impacts of COVID-19 quarantines on both children and parents within the same household. Such research will help to develop a more comprehensive picture of quarantine practices and policies on specific sub-populations of individuals. Furthermore, although some studies have been able to report on individuals' *physical* health before and during quarantine (e.g., through assessments of obesity and diabetes), we are not aware of any studies that have been able to directly assess children's or parents' psychological wellbeing at a time period just before quarantine and again within 1–2 months after quarantine began. Such data offer more direct, rather than retrospective, accounts of wellbeing and are therefore methodologically stronger in design.

Collectively, there are good reasons to expect that school closures together with self-isolation and social distancing present particular challenges for children and adolescents with dyslexia

and we may expect that quarantines resulting from COVID-19 could increase psychological and educational problems in both parents and their children with dyslexia. However, this remains an empirical question and the main objective of this study is to examine the psychological and educational impact of COVID-19 quarantine on students with dyslexia (e.g., depression, anxiety, reading motivation, reading habits) and their parents (e.g., distress). In doing so, we seek to address some existing limitations within the rapidly emerging COVID-19 research on psychological wellbeing and aim to answer the following research questions (RQs)–based on both pre-quarantine and concurrent-quarantine data—from a sample of Spanish children with dyslexia and their parents.

RQ1: Based on self-report, what are the psychological (e.g., symptoms of depression and state anxiety) and reading-related impacts (e.g., perceived value of reading and actual engagement with reading, reading habits) of the 2020 national quarantine on children with dyslexia?

RQ2: For children with dyslexia, how does the quarantine impact the child's emotional and behavioral (e.g., conduct problems, hyperactivity-inattention problems) state as reported by a parent?

RQ3: To what extent does quarantine impact parental stress and other aspects of mental health for parents who have a child with dyslexia?

RQ4: Are there any pre-quarantine predictors of negative impact on children's emotional wellbeing or parent distress during the quarantine?

RQ5: During quarantine for children with dyslexia, what are some key educational conditions and impacts, as reported by a parent?

MATERIALS AND METHODS

Participants

Participants included 32 children with dyslexia as well as the mother of each child participant. Like each mother, fathers of the child participants were also asked to participate by completing measures used in the study; however, as will be described later, in only a small number of instances did the father collaboratively complete a measure with the child participant's mother. For brevity, we refer to the school-aged participants as “child” or “children” even though some participants' ages could be classified as early adolescence. Additional details about all study participants are provided below in the respective sub-sections.

The study respected all principles outlined in the current legislation on research investigations and was approved by the Research Ethics Committee of the University of Valencia, which is regulated by Ethical Principles for Medical Research Involving Human Subjects and aligns with the Declaration of Helsinki (World Medical Association [WMA], 2013). For example, prior to commencing any study procedures, parents' informed consent was obtained.

Children With Dyslexia

All 32 child participants were Caucasian, lived in Spain at the time of the study, and spoke Spanish as their primary language. Moreover, children were attending 21 schools (8 primary schools and 13 secondary schools). They ranged from 9 to 14 years old (mean age = 10 years and 11 months, $SD = 1$ year and 5 months. Seventeen identified as male and fifteen as female).

These participants were recruited from referrals to a multi-year investigation that began several years before the COVID-19 pandemic. Preliminary selection of potentially eligible child participants was consistent with past studies (e.g., Pereira-Laird et al., 1999; Soriano-Ferrer and Miranda, 2010; Begeny et al., 2011; Soriano-Ferrer et al., 2011), such that potential dyslexia participants in the present study were recommended by their teachers based on students' low reading achievement in the classroom. The actual presence of dyslexia for child participants was then determined by using the DSM-5 (American Psychiatric Association [APA], 2014) criteria specified for identifying students with a specific LD: (a) scores of 80 or above on an intelligence test (Cattell and Cattell, 2006), in order to exclude students with cognitive impairments; (b) no evidence or history of neurological damage, significant economic disadvantage, emotional disturbance, hearing or vision abnormalities, or any other major handicapping condition; and (c) a reading achievement score at or below the 25th percentile on the word-reading and/or pseudoword-reading skill subtests (accuracy and/or speed) from the Standardized Reading Skills Battery (PROLEC-R, Cuetos et al., 2002; PROLEC-SE, Ramos and Cuetos, 2003).

Three participants (9.4%) had been retained in a grade, 46.9% had received services in the school's resource room prior to this study, and 87.5% were reported by the teacher as needing help with homework. Eleven (34.4%) of the children had no siblings, 53.1% had a sibling, and 12.5% had two or more siblings. **Table 1** shows the characteristics of all child participants.

Parents/Caregivers of Children With Dyslexia

Each mother of the 32 aforementioned children participated in this study. Like the child participants, these caregivers (henceforth referred to as *parents*) had also participated in past components of this multi-year investigation. **Table 2** includes parents' demographic information and includes fathers' information to provide a clearer picture of child participants' parents. Mothers' age ranged from 30 to 52 years (mean age = 42 years, 1 month, $SD = 4$ years, 1 month), and fathers' age ranged from 38 to 60 years (mean age = 44 years, 2 months, $SD = 4$ years, 8 months). Most parents' highest level of education (53.1% of mothers and 65.5% of fathers) was a diploma from Secondary School. Approximately 22–24% of mothers and fathers had a degree from a university. All fathers and 69% of mothers reported having a paid job. In accordance with the International Standard Classification of Occupations (International Labour Organization [ILO], 2012), the occupations of fathers and mothers were distributed into occupations with four levels of skills (see **Table 2**). Due to the COVID-19 pandemic, some parent participants lost their jobs (9.4% of mothers and 3.4% of fathers), and others had their

working hours reduced (18.7% of mothers and 34.5% of fathers). Additionally, 68.7% ($n = 22$) of the parents were married or living together, 9.4% ($n = 3$) reported being single or widowed, and 21.9% were separated ($n = 7$).

Measures

Twelve total measures were used for purposes of this study, most of which were administered both before and during Spain's 2020 national quarantine. For clarity in our method, each section specifies if the respective measure was completed before quarantine, during quarantine, or both.

TABLE 1 | Characteristics of child participants.

	<i>M</i>	<i>SD</i>
Age	10.96	1.49
IQ	106.78	10.64
Word reading accuracy	34.16	5.32
Word reading speed	79.60	32.28
Word reading fluency	49.95	19.64
Pseudoword reading accuracy	28.84	7.26
Pseudoword reading speed	95.69	33.28
Pseudoword reading fluency	34.03	15.07
Sex	N	%
Male	17	53.1
Female	15	46.9
Academic Qs	N	%
Grade retention	3	9.4
Resource room	15	46.9
Homework Help	28	87.7
Siblings	N	%
No siblings	11	34.4%
1 Sibling	17	53.1%
>2	4	12.5%

TABLE 2 | Characteristics of parent participants.

	Mothers (N = 32)		Fathers (N = 29)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age (years)	42.2	4.2	44.3	4.9
Highest level of education completed	N	%	N	%
Elementary	8	25	3	10.3
Secondary	17	53.1	19	65.5
University	7	21.9	7	24.1
Occupation^a	N	%	N	%
Without a paid job	10	31.2	0	0
Skill level 1	12	37.5	4	13.8
Skill level 2	5	15.6	20	69.0
Skill level 3	5	15.6	5	17.2
Skill level 4	0	0	0	0

^aBased on the International Standard Classification of Occupations (International Labour Organization [ILO], 2012).

Measures Completed by Each Child Participant

Factor “g” intelligence test (scale 2, form A)

This intelligence test (Cattell and Cattell, 2006) was administered to child participants prior to the quarantine to assess general mental capacity without the interference of verbal stimuli. The reliability of the Spanish adaptation of this intelligence test is 0.86. In the current sample, the Cronbach's alpha was 0.79.

Standardized reading skills battery

Prior to the quarantine, each child's word and pseudoword reading skills were measured with the Standardized Reading Skills Battery (PROLEC-R, Cuetos et al., 2002; PROLEC-SE, Ramos and Cuetos, 2003). Word reading requires the correct identification of 40 words that vary greatly in frequency, length and spelling structure (CCV, CVV, CVC, CCVC, CVVC, and VC, where C = consonant and V = vowel), and pseudoword reading consists of pronouncing 40 pseudowords, constructed by changing or adding one or two letters to each of the 40 words on the reading test. In word and pseudoword reading, task completion is timed. Two combined scores of fluency are obtained, one based on word reading fluency and the other on pseudoword reading fluency. In both cases, the child's score consists of an accuracy score divided by the reading speed, measured as the time taken to complete the task, and then multiplied by 100. These reading batteries have adequate internal consistency with a Cronbach's alpha >0.70 for words and pseudowords reading in both the normalization sample and the current one.

Children's depression inventory-short form

Before and during quarantine, depressive symptoms were measured using the Children's Depression Inventory-Short Form (CDI-S) (Kovacs, 1992), which is a self-assessment screening tool of 10 items. Children mark one of three statements best describing their feelings within the past 2 weeks. Items statements indicate the severity of depressive symptomatology and are arranged in either increasing or decreasing order. Total scores range from 0 to 20, whereas high sum scores indicate a more severe symptomatology. The Spanish adaptation of this inventory for children, ranging from 9 to 15 years old, has adequate reliability with a Cronbach's alpha of 0.71 (Del Barrio et al., 2002). In the current sample, the Cronbach's alpha was 0.69.

State-trait anxiety inventory for children

Before and during quarantine, children completed the state anxiety subscale of the Spanish adaptation of the State-Trait Anxiety Inventory for Children (STAIC) (Spielberger, 2014). The state anxiety subscale evaluates the current state of anxiety, asking how respondents feel “right now,” using items that measure subjective feelings of apprehension, tension, nervousness, worry, and activation/arousal of the autonomic nervous system. This subscale includes 20 Likert-type items, scoring on a three-point scale, ranging from 1 (almost never) to 3 (almost always). The Cronbach's alpha is reported to be 0.94 (Spielberger, 2014). In the current sample, the Cronbach's alpha was 0.90.

Motivation to read profile-revised

Before and during quarantine, children responded to the Motivation to Read Profile-Revised (MRP) (Malloy et al., 2013),

The 20-item survey assesses two specific dimensions of reading motivation: self-concept as a reader and value of reading. The items that focus on self-concept as a reader are designed to elicit information about students' self-perceived competence in reading and their self-perceived perception relative to peers. The value of reading items elicits information about the value students place on reading tasks, particularly in terms of frequency of reading engagement and reading-related activities. Students respond to items using a 1–4 Likert scale, with four representing the most positive response. Cronbach's alpha revealed a moderately high reliability for both subscales (self-concept = 81; value = 0.87) and for the full scale 0.87 (Malloy et al., 2013). In the current sample, the Cronbach's alpha was 0.87, 0.95, and 0.97, for self-concept, value and total scale respectively.

Task-value scale for children

Before and during quarantine, children's task motivation was measured in an interview using the Task-value Scale for Children (TVS-C) (Nurmi and Aunola, 2005; Aunola et al., 2006). This scale measures children's task motivation in school and in home. In the present study, we used the three items measuring children's intrinsic value (e.g., “How much do you like doing reading-related tasks at home?”). Each item was rated on a five-point Likert scale (1 = I do not like it at all/I dislike doing those tasks; 5 = I like it very much/I really enjoy doing those tasks). A sum score for subject-related intrinsic value was created by calculating the mean of the three scores for the three items. Cronbach's alpha is reported to be 0.88 (Aunola et al., 2006). In the current sample, the Cronbach's alpha was 0.84.

Reading activity inventory

Before and during quarantine, the Reading Activity Inventory (RAI) was used to measure the breadth (genres read) and frequency (how often a genre was read) of students' reading (Guthrie et al., 1994). The shortened version of 10 items by Wigfield and Guthrie (1997) was used in this study. The children were asked to answer five questions about what they read (mystery books, sports books, adventure books, comic/magazine and nature books) and how often they read for fun. If the child indicated that a given kind of book was read in the last week, the child was then asked to give its title. The child then is asked to indicate how often he or she reads that kind of book, responding on a 1–4 scale from almost never to almost every day. Although there is no traditional reliability for this measure, the fall and spring administrations of the measure correlated 0.54 ($p < 0.001$), suggesting a substantial level of stability in the measure (Wigfield and Guthrie, 1997). In the current sample, the Cronbach's alpha was 0.84 for breadth and 0.70 for frequency of reading.

Measures Completed by a Parent of Each Child Participant

Demographic information questionnaire

At the very beginning of the study, parents supplied information about their sex, level of education, occupation (based on the International Standard Classification of Occupations), and marital status. They also responded to items about the number of children being raised in the child participant's home and the child participant's past and current schooling (e.g., number of grade retentions, whether they received homework help).

Strengths and difficulties questionnaire

Before and during the quarantine, parents were asked to complete the Spanish version of the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 2001; Ortuño-Sierra et al., 2017) which is designed to gather information about emotional and behavioral difficulties experienced by children from 4 to 17 years old. The current study focuses specifically on the following subscales: *emotional symptoms* (e.g., often unhappy, down-hearted), *conduct problems* (e.g., often has temper tantrums or hot temper) and *hyperactivity-inattention* (e.g., restless, overactive, cannot stay still for long). Each subscale is measured by five items, rated by a three-point scale ranging from 0 (strongly disagree) and 2 (strongly agree). To obtain the total scores, items are summed. Normative data of Español-Martín et al. (2020) that set at 90th percentile as the clinical cut-off range were used. The test has been shown to have criterion validity and good test-retest reliability after 4 and 6 months (mean = 0.62). Furthermore, the internal consistency is satisfactory, with a Cronbach's alpha ranging from 0.57 to 0.88 (Goodman, 2001). The Spanish adaptation by Ortuño-Sierra et al. (2017) showed an internal consistency for Total Difficulties score of 0.84, ranging from 0.75 to 0.78 for the SDQ subscales. In the current sample, the Cronbach's alpha was 0.96 for emotional problems, 0.92 for conduct problems, and 0.82 for hyperactivity-inattention.

Parenting stress index-short form

Before and during the quarantine, the Parenting Stress Index-Short Form (PSI-SF) was used to evaluate parenting and family characteristics—with the aim of identifying potential for parental behavior problems and child adjustment difficulties within the family system (Abidin, 1995). In this study, we used the Spanish PSI-SF (Díaz-Herrero et al., 2010, 2011). PSI-SF includes 36 items and yields a Total Stress Score from three scales (12 items per scale): Parental Distress (PD), Parent-Child Dysfunctional Interaction (PCDI), and Difficult Child (DC). Each item is scored on a five-point Likert scale, from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating greater levels of parental stress. The PD domain measures the distress experienced by parents due to personal factors, such as depression or conflict with a partner, or life restriction due to the demands of childrearing in their role as parents. The PCDI domain focuses on the perception of the child as not responsive to parental expectations. The DC subscale represents behaviors that children often engage in that may make parenting easier or more difficult. The scale also provides a measure of total stress by adding up the scores of the 36 total items. The PSI-SF shows high internal consistency (Cronbach's alpha): 0.84 (PCDI), 0.82 (PD /DC), and 0.90 for Total Stress. In the current sample, the Cronbach's alpha was 0.70 for PD, 0.80 for PCDI, 0.73 for DC, and 0.86 for total stress.

The general health questionnaire

During the quarantine, parent mental health was measured using the 12-item General Health Questionnaire (GHQ-12) (Goldberg et al., 1997), which is a self-assessment screening tool. The Spanish version of this questionnaire has good psychometric properties and the Cronbach's alpha coefficient was 0.86 for

persons of ≤ 65 years and 0.90 for ≥ 65 years (Rocha et al., 2011). The questionnaire includes response options that range from 0 (never) to 3 (usually). Total scores range from 0 to 36 with higher scores indicating higher degrees of disturbance of the general health status. A total score higher than 12 points (Percentile score > 75) indicates a “tendency toward psychological problems.” In the current sample, the Cronbach's alpha was 0.75.

Questionnaire about educational conditions and potential impacts of quarantine on children with dyslexia

Developed for the purposes of this study and to align specifically with educational issues potentially occurring during the COVID-19 pandemic, we used a 16-item questionnaire during the quarantine to ask parent participants questions about remote learning, time spent on learning, difficulties in homework, help from teachers, and some educational worries of parents during the national quarantine. For brevity, we will henceforth refer to this measure as the *Quarantine Questionnaire about Education* (QQE). Table 6 summarizes all questions that were asked in the QQE.

Procedure

Parents provided informed consent during the initial evaluation of each child's Factor “g” Intelligence Test, Standardized Reading Skills Battery, and demographic information questionnaire which occurred between November 1, 2019 and January 23, 2019. An experienced and licensed clinical psychologist (an author of this paper) administered the intelligence and reading assessments in random order and in a setting free from noise and distractions. Test sessions varied in length depending on the participant being assessed. Following these assessments, between February 2 and 11, 2020, the additional child measures were administered by the same clinical psychologist in random order through an interview. Mothers completed the measurements while their son was being interviewed. In May 2020, each evaluation administered during the quarantine was carried out in two or three sessions by means of telephone interviews or by videoconference (with Blackboard Collaborate) with the children and their parents. Thus, CDI-S, STAIC, MRP, TVR-C, RAI, SDQ, and PSI-SF were filled before and after quarantine in a random order, while GHQ-12 and QQE were filled only during confinement. This assessment corresponded to approximately 1.5 months (i.e., 45–47 days) after the national quarantine began in Spain. Parent participants who had multiple children in the household were specifically asked to respond to all questions and surveys for the specific child participant in the study. Measures intended for parents (i.e., the SDQ, PSI-SF, GHQ-12, and QQE) were mainly completed only by the child participant's mother (81.2%; $n = 26$); however, for 18.7% ($n = 6$) of the child participants, the SDQ was completed collaboratively by both parents. The PSI-SF, GHQ-12, and QQE were completed only by mothers.

Data Analysis

We analyzed data using SPSS version 24. First, descriptive statistics were used to describe the participants' characteristics before quarantine (see Tables 1, 2) and to analyze educational data regarding to our RQ 5. Thus, descriptive statistics were

provided as a mean and SD for continuous variables; frequencies and percentages were used for categorical variables. Regarding analysis for our RQs 1, 2, and 3 we used paired t tests to evaluate the significance of changes (before and during quarantine) in children with dyslexia and their parents. To control for multiple comparisons, the level of significance was established after applying the Bonferroni correction ($0.05/15 = 0.003$). We report effect sizes using the Cohen's d , with values between 0.00 and 0.20 considered small effect sizes, values between 0.20 and 0.50 considered medium, and values above 0.80 considered large effect sizes. Finally, in order to analyze data regarding RQ 4, based on previous studies (Mikolajczak et al., 2018; Colizzi et al., 2020; Marchetti et al., 2020a,b; Spinelli et al., 2020) we carried out different multiple linear regression analyses to find out if any pre-quarantine variables influenced children's emotional problems (e.g., anxiety) or parents' stress during quarantine.

RESULTS

Psychological and Reading-Related Impacts of Quarantine as Reported by Children With Dyslexia (RQ 1)

As measured by the CDI-S and STAIC respectively, children with dyslexia showed significantly higher levels of depression ($t_{(31)} = -8.1, p = 0.001, d = -1.4$) and state anxiety ($t_{(31)} = -6.6, p = 0.001, d = -1.2$) during the quarantine compared to before the quarantine period, with large effects sizes in both cases (see Table 3). Note that t -scores and Cohen's d are negative when a

variable increased during quarantine and are positive when the score is lower during quarantine.

As measured by the MRP, children with dyslexia also had significantly lower scores during the quarantine on the Value of Reading subscale ($t_{(31)} = 6.9, p = 0.001, d = 1.2$) and Reading Motivation total score ($t_{(31)} = 7.7, p = 0.001, d = 1.4$). Similarly, children's task-value motivation, as measured by the TVS-C, also decreased at significant levels during quarantine ($t_{(31)} = 10.1, p = 0.001, d = 1.8$). With each of these changes, we observed large effect sizes (d range = 1.2–1.8).

Regarding reading activity, children on average reported through the RAI that they significantly decreased their breadth of reading during quarantine ($t_{(31)} = 6.6, p = 0.001, d = 1.2$) and most children decreased the types of books they read. In the before quarantine period, 18.8% ($n = 6$) of child participants indicated they did not read any type of book last week, and 81.3% ($n = 26$) read between one and three types of books. In contrast, during the quarantine, 50% ($n = 16$) reported they did not read any books last week. However, there were no statistically significant differences in children's reported frequency of reading. Specifically, before the quarantine, 90.6% of the children with dyslexia reported they "almost never" read for fun and then 100% reported this during the quarantine. The restricted variability may have influenced a lack of statistically significant findings (i.e., even before quarantine, 90% of the children almost never read for fun).

Parent Perspectives of Emotional and Behavioral States for Children With Dyslexia (RQ 2)

Overall, parents reported some significant changes in children's emotional and behavioral symptoms (rated using the SDQ scale) before and during the quarantine (see Table 4). According to parents' ratings, children with dyslexia scored significantly higher during the quarantine than before the quarantine on all three subscales: Emotional Symptoms ($t_{(31)} = -4.5, p = 0.001, d = -0.8$), Conduct problems ($t_{(31)} = -5.1, p = 0.001, d = -0.9$), and Hyperactivity-Inattention ($t_{(31)} = -7.0, p = 0.001, d = -1.2$), with large effect sizes in all cases. Table 4 also shows that the percentage of participants rated above the clinically significant range on the SDQ was higher during the quarantine period than before the quarantine. Before the quarantine, the percentage of children with clinical scores ranged from 3.1% for Hyperactivity-Inattention to 15.5% for Emotional Symptoms; however, during the quarantine, the percentage of children rated with clinically significant scores ranged from 18.8% (for Hyperactivity-Inattention) to 53.1% (for Emotional Symptoms).

Mental Health Impacts of Quarantine on the Parents Who Have a Child With Dyslexia (RQ 3)

Using the PSI-SF, parent participants reported significant changes in parenting stress during the quarantine (see Table 5). For example, during quarantine parents reported higher scores on the subscale areas of Parental Distress ($t_{(31)} = -14.4, p = 0.001, d = -2.4$), Parent-Child Dysfunctional Interaction ($t_{(31)} = -10.2$,

TABLE 3 | Psychological and motivational impact of Spain's National Quarantine on children with dyslexia.

Measure	Before quarantine		During quarantine		$t_{(31)}$	p	d
	Mean	SD	Mean	SD			
Depression (CDI-S)	3.0	2.5	5.3	1.9	-8.1	0.001	-1.4
State anxiety (STAIC)	42.7	7.6	47.5	6.56	-6.6	0.001	-1.2
Reading motivation (MRP)							
Reading Self-Concept Subscale	21.9	3.3	21.6	2.8	1.7	0.096	-0.3
Value of Reading Subscale	25.1	4.3	22.7	5.2	6.9	0.001	1.2
Total Score on MRP	47.0	5.5	44.3	6.1	7.7	0.001	1.4
Task-Value (TVS-C)	9.1	2.7	5.9	2.1	10.1	0.001	1.8
Reading activity (RAI)							
Breadth of Reading	1.5	1.0	0.7	0.9	6.6	0.001	1.2
Frequency of Reading	1.1	0.4	1.0	0	1.6	0.129	0.3

t-scores and Cohen's d are negative when a variable increased during quarantine, and are positive when the score is lower during quarantine.

TABLE 4 | Parents' perceived impact of Spain's National Quarantine on emotional and behavioral difficulties of children with dyslexia.

SDQ domains	Before quarantine			During quarantine			$t_{(31)}$	p	d
	Mean	SD	% (N) ^a	Mean	SD	% (N) ^a			
Emotional symptoms	3.1	2.5	15.6 (5)	3.9	2.5	53.1 (17)	-4.5	0.001	-0.80
Conduct problems	1.3	1.5	9.4 (3)	2.1	1.8	21.9 (7)	-5.1	0.001	-0.90
Hyperactivity-inattention	3.3	1.4	3.1 (1)	4.7	1.3	18.8 (6)	-7.0	0.001	-1.24

^aPercentage (%) and N with Clinically Elevated Score; t -scores and Cohen's d are negative when a variable increased during quarantine, and are positive when the score is lower during quarantine.

TABLE 5 | Impact of Spain's National Quarantine on the stress of parents with a child who has dyslexia.

PSI-SF	Before quarantine		During quarantine		$t_{(31)}$	p	d
	Mean	SD	Mean	SD			
PD	27.6	6.1	44.5	5.7	-14.4	0.001	-2.4
PCDI	24.0	3.3	36.5	7.2	-10.2	0.001	-2.0
DC	26.6	4.9	35.6	6.0	-7.2	0.001	-1.7
Total stress	78.1	7.4	116.6	11.8	-21.4	0.001	-3.8

PD = Parental Distress; PCDI = Parent-Child Dysfunctional Interaction; DC = Difficult Child. t -scores and Cohen's d are negative when a variable increased during quarantine, and are positive when the score is lower during quarantine.

$p = 0.001$, $d = -2.0$), and Difficult Child ($t_{(31)} = -7.2$, $p = 0.001$, $d = -1.7$). Given the subscale increases in stress during the quarantine, the Total Stress scale was also significantly higher ($t_{(31)} = -21.4$, $p = 0.001$, $d = -3.8$). Furthermore, 31.3% of mothers scored above the clinically significant range (with a Percentile Score >75) on the GHQ-12, showing a tendency toward psychological difficulties during the quarantine.

Predictors of Negative Impacts of Quarantine on Children's Emotional Difficulties and Parents' Stress (RQ 4)

Finally, in order to determine if any pre-quarantine variables influenced children's emotional problems (e.g., anxiety) or parents' stress during quarantine different models of multiple linear regression have been run. In the case of children, we used different pre-quarantine variables as independent variables (e.g., marital status, number of siblings, parent-child interaction, ...) and level of anxiety and depression during quarantine as dependent variables. In the case of the parents, different pre-quarantine variables (e.g., marital status, number of children, child's behavioral problems, ...) were used as independent variables and the total stress score during quarantine was the dependent variable.

When predicting children's emotional problems during confinement, the model that was significant ($F_{(2,29)} = 10.773$, $p < 0.001$) explained 38% (adjusted $R^2 \times 100$) of the state anxiety experienced by the children during quarantine. The pre-quarantine predictors that were significant were parent-child

dysfunctional interaction ($\beta = 0.405$, $t = 2.69$, $p < 0.05$) and the marital status [1 = married or cohabitating; 0 = living alone] of their parents ($\beta = -0.434$, $t = -2.94$, $p < 0.01$).

In the case of parents, the model that was significant ($F_{(3,28)} = 17.170$, $p < 0.001$) explained 61% (adjusted $R^2 \times 100$) of parental stress during quarantine. The pre-quarantine variables that were significant were the number of children ($\beta = 0.256$, $t = 1.67$, $p < 0.05$), marital status ($\beta = -0.677$, $t = -4.82$, $p < 0.001$), and the child's behavior problems ($\beta = 0.312$, $t = 2.07$, $p < 0.05$).

Educational Conditions and Impact of Quarantine on Children With Dyslexia, as Reported by Parents (RQ5)

Frequencies and percentages of the educational conditions and challenges are shown in Table 6. As shown, approximately 90% of parents reported having electronic devices for remote learning, although 71.9% also reported that such electronic devices were shared by other family members, such as siblings and parents. In relation to remote learning, 100% of teachers used online tasks through software such as Moodle, but only 21.9% occasionally attended their classes online with a teacher present. Parents reported that 56.2% of children spent less than 4 h per day on learning and 43.8% spent between 4 and 7 h. Further, 56.3% of children with dyslexia used audiobooks and/or readers for completing the school reading activities.

All parents of children with dyslexia reported difficulties in establishing study routines and homework completion. In fact, 100% of parents indicated their child needs help with homework. The majority of parents (90.6%) spent more than 3 h per day supporting their child's learning and 96.9% (all but one parent) indicated that the pandemic has negatively affected their child's learning. At the time of the survey, all but two parents responded "no" when asked if the child's teacher assisted the parent with knowing how to best support the student with homework. Similarly, 68.9% of parents reported they had difficulties cooperating with the child's teachers and that their child had difficulties completing tasks on time. The large majority (78.1%) of parents indicated that their child with dyslexia received less support for reading difficulties during quarantine, none received a similar amount, and 21.9% reported that the child received no special attention for their reading difficulties. Finally, the majority of parents were very worried about the child's learning and school success (100%), the child's motivation and interest in reading and in learning (84.4%), the child's peer relations (78.1%), and the professional skills of the child's teacher (71.9%).

DISCUSSION

The COVID-19 outbreak was a new and unexpected situation that quickly became a large-scale pandemic. Within Spain, and likely other countries, many have argued that the consequences of school closures and keeping children locked at home to prevent the spread of COVID-19 did not fully consider other important aspects of families' and children's wellbeing—including but not

TABLE 6 | Educational conditions and potential challenges reported by parents during Spain's National Quarantine.

Summary of all survey questions and response options on the QQE	N	%
Child has access to electronic devices to use for learning		
Yes, and is the only person in household to use that device	6	18.8
Yes, but shared with others (siblings, parents)	23	71.9
No	3	9.4
Child completes online classes with teachers		
Yes	7	21.9
No	25	78.1
Online tasks (e.g., Moodle)	32	100
The average time per day each child spends on learning (in total hours per day)		
≤4 h	18	56.2
4–7 h	14	43.8
≥7 h	0	0
Child needs help with homework during quarantine		
Yes	32	100
No	0	0
Average time per day supporting your child(ren) with learning during quarantine		
Less than 1 h	0	0
1–2 h	3	9.4
3–4 h	23	71.9
More than 4 h	6	18.7
Use of audiobooks and/or readers for school reading activities		
Yes	18	56.3
No	14	43.8
Difficulties in establishing study routines and with homework		
Yes	32	100
No	0	0
Difficulty completing tasks on time		
Yes	20	62.5
No	12	37.5
Quarantine has negatively affected your child's learning		
Yes	31	96.9
No	1	31.1
Difficulties cooperating with the teacher		
Yes	22	68.8
No	10	31.3
The teacher helped me understand how to best support my child with homework		
Yes	2	6.3
No	30	93.8
Is special attention offered by your child's teacher to improve reading skills during quarantine?		
Yes, with similar amount of attention before quarantine	0	0
Yes, but with less attention during quarantine	25	78.1
No	7	21.9
Which of the following are you most worried by during the quarantine (select all that apply):		
The child's learning and school success	32	100
Professional skills of child's teacher	23	71.9

(Continued)

TABLE 6 | Continued

Summary of all survey questions and response options on the QQE	N	%
The child's motivation and interest in learning and reading	27	84.4
The child's peer relationships	25	78.1

This survey was developed for the purposes of this study and to understand educational circumstances during Spain's 2020 national quarantine and response to COVID-19. Each bolded item summarizes the question posed to the parent and immediately below each bolded item are the response options. QQE = Quarantine Questionnaire about Education.

limited to their psychological and educational wellbeing (Smith, 2020; United Nations Educational, Scientific, and Cultural Organization [UNESCO], 2020). Recently published studies have begun to demonstrate several negative impacts of quarantine on students' mental health and schooling (e.g., Brooks et al., 2020; Francisco et al., 2020; Gómez-Becerra et al., 2020; Orgilés et al., 2020, 2021), but to our knowledge, our study is the first to specifically examine the psychological and educational impact of the COVID-19 pandemic on students with dyslexia as well as the parents of students with dyslexia. It is also one of only a small number of studies with data collected about participants' wellbeing shortly before and then again during the quarantine.

First and foremost, our findings highlight several negative psychological and educational impacts that national quarantine conditions can have on students with dyslexia and in their parents. Using self-report measures, our participants with dyslexia showed significantly increased symptoms of depression and state anxiety during the quarantine. This finding is generally consistent with other recent studies that included children and adolescents without learning disabilities (e.g., Cao et al., 2020; Duan et al., 2020; Francisco et al., 2020; Xie et al., 2020; Orgilés et al., 2021), but our study helps to evidence participants' degree of mental health changes from before to during quarantine conditions. Our study also bolstered data from children's self-reports about mental health by including parental reporting. Specifically, during the quarantine compared to before, we found that parents rated their child with dyslexia to have significantly more emotional difficulties, conduct problems, and hyperactivity-inattention (as measured with the SDQ). We also found that during the quarantine, the percentage of students with dyslexia who were above the clinical cut-off range was 53.1% for Emotional Symptoms, 21.9% for Conduct Problems, and 18.8% for Hyperactivity-Inattention. Our results are the first to document such changes from before to during quarantine conditions, but children's presence of difficulty during the quarantine correspond well with the findings reported by Gómez-Becerra et al. (2020). In their study, which evaluated a wide range of individuals during the quarantine between 3 and 18 years old (all living in Spain), they found similar percentages of students with clinically elevated scores on the SDQ: 48.6% for Emotional Symptoms, 24.2% for Conduct Problems, and 20.3% for Hyperactivity-Inattention.

Conditions of COVID-19 and Spain's national quarantine also had a negative influence on our participants' reading motivation

and reading activity. For instance, during quarantine, children reported significantly less motivation for reading on measures of the MRP and TVS-C and significantly less breadth of reading on the RAI. These findings are important because they clearly highlight a critical need to support students with dyslexia during atypical schooling conditions, just as it is well understood that such students should be well supported under more typical school conditions (Nelson and Harwood, 2011a; Morte-Soriano et al., 2020). These findings are also important because one cannot assume that most students will have less reading motivation during quarantine conditions. For instance, studies of adults and children without learning disabilities suggest that many such individuals have spent even more time reading, and read with greater breadth, during quarantine conditions (Adeyemi, 2020; Tyagi et al., 2020).

Another goal of our study was to explore the predictive power of different pre-quarantine variables to potentially explain emotional problems in children with dyslexia during quarantine. Thus, pre-existing conditions like difficult interaction between parent-child, and living with a divorced / separated or single parent, seem to have a great impact on the state anxiety of children with dyslexia. Previous research has shown that parental status (e.g., divorced or single) seems to comprise a risk factor for fear and anxiety, and health risks and fear connected to COVID-19 influence parents' levels of stress both at the individual level (e.g., being over-reactive, feeling nervous, irritable) and at the dyadic level (e.g., parent-child dysfunctional interactions, finding it difficult to enjoy interactions with the child, and child behavioral and emotional expressions); and, as a consequence, children's psychological problems are impacted (Spinelli et al., 2020). Similarly, Orgilés et al. (2020, 2021) found a relationship between parents' stress and their children's emotional state. In other words, these studies show that anxiety and depression symptoms were more likely in children whose parents reported a higher level of stress. In fact, primary caregivers' level of stress was related to 25 of 31 child symptoms (Orgilés et al., 2020). As Marchetti et al. (2020b) point out, parents experiencing high psychological distress may be less attentive to and warm with their children, and they may also transfer the burden of their emotional distress to their children, which could affect their children's adjustment.

Our study also highlighted the impacts of quarantine conditions and the relative wellbeing of parents who have a child with dyslexia. Findings showed that compared to pre-quarantine conditions, mothers reported significantly greater stress and undesired interactions with their child during quarantine. These findings are new and important to report in the context of evaluating parents of students with dyslexia, but the data appear consistent with what might be expected during a quarantine. For instance, some studies point out that dealing with confinement is a particularly stressful experience for parents who must balance personal life, work, and raising children (Marchetti et al., 2020a,b; Mazza et al., 2020a,b; Spinelli et al., 2020). In the case of students with dyslexia, parents must cope with poor academic progress, a greater need to help with homework, and seek appropriate help for reading instruction or support. Additionally, approximately one-third of mothers scored above the clinically significant

range on the GHQ-12, further elucidating the high levels of psychological distress (an emotional state characterized by depressive and anxious symptoms) during quarantine conditions. These results are generally consistent with those reported by others. In Spain, Rodríguez-Rey et al. (2020) reported that 37% of adults experienced psychological distress, in China Liang et al. (2020) reported that 40.4% of youth were prone to psychological distress and in Italy, more than 80% of their sample reported high levels of psychological distress and 17% reported parenting-related exhaustion (Marchetti et al., 2020b).

The present results also revealed some predictors of parents' stress during quarantine, such as number of children, marital status (e.g., divorced or single), and the child's behavior problems. This finding is in line with previous studies (Mikolajczak et al., 2018; Marchetti et al., 2020a,b; Spinelli et al., 2020) that have highlighted risk factors for parenting stress, relating to socio-demographic characteristics (e.g., having a larger number of children, lacking a domestic partner) or child features (e.g., special needs, externalizing symptoms, ADHD, behavior problems). However, further studies should examine this issue in even greater depth.

Consistent with parental reports of distress, most if not all the parents in our study reported, for example (a) their child having difficulty with establishing study routines and completing school-related tasks on time, (b) spending on average three or more hours each day assisting children with learning, (c) negative overall impacts on their child's learning and less attention from the child's teacher to support reading skills, and (d) not getting sufficient support from the child's teacher. Obviously, facing such circumstances during more than a month of quarantine is likely to significantly increase parents' risk of stress, including parents of children without learning disabilities (Spinelli et al., 2020).

Study Limitations, Implications, and Future Research Directions

As an initial evaluation of quarantine conditions on students with dyslexia and their parents, our study should be understood while considering its limitations. For example, this study used child and parent wellness reports; however, only mothers completed all measures. Mothers' and fathers' ratings should be considered in future studies in an attempt to determine whether mothers or fathers perceive wellbeing similarly. Also, future research should attempt to add observational measures. This is indeed a challenging task during quarantine, but with significant resources, video recording could be used as a possible means of direct observation. Also, our sample is not representative of all students in Spain (or students globally) with dyslexia and future research is needed over time to gather data from a larger and even more representative sample. Similarly, future research should aim to broaden our understanding of how quarantine conditions impact children's educational and psychological wellbeing by including additional measures (e.g., direct assessments of reading during quarantine, more comprehensive assessments of depression or anxiety) and exploring possible mediators or moderators among variables. Components of time (e.g., for how long has the child or parent

been experiencing quarantine) and specific behavior (e.g., to what degree has “typical” educational conditions, such as in-person schooling, changed during quarantine) must also be examined to understand short-term and long-term impacts of quarantine. Although it is impossible to know for sure right now whether negative impacts of quarantine will improve or worsen over time, many have argued that psychological and educational impacts will worsen over time (Brooks et al., 2020; Gómez-Becerra et al., 2020), especially for those who are most economically, educationally, or psychologically vulnerable (Miranda et al., 2005, 2008, 2013; Soriano-Ferrer and Contreras, 2012; Bonifacci et al., 2019; Asbury et al., 2020; Colizzi et al., 2020; Marchetti et al., 2020a; Smith, 2020; Iriarte-Redín et al., 2021).

With limited research currently available on the impacts of quarantine conditions on children with dyslexia and their parents, we choose not to overstate our findings by offering in depth implications or recommendations. One simple observation is that much more research is needed to better understand the impacts of COVID-19 on educational and psychological wellbeing and understand how to best address all negative impacts with prevention and intervention. Clearly, negative impacts were observed during quarantine compared to pre-quarantine conditions for the participants in our study (and those of other studies), but given the unprecedented circumstances of this pandemic, it is unknown to what degree we would expect this level of negative impact. A pandemic is inevitably going to have negative impacts across a range of areas—including but not limited to mental health and education—but it is impossible to know at this time to what extent national policies and practices during quarantine minimized the greatest possible harm of a pandemic. For this reason, national and international research directly examining psychoeducational impacts of COVID-19 (and quarantines more specifically) is essential so that policies and strategies can align with needs and actions that best minimize harm in large-scale and equitable ways. Using frameworks of internationalization (e.g., van de Vijver, 2013; Begeny, 2018; Begeny et al., 2018; Bernardo et al., 2018), such research (within and across countries) can leverage understanding, knowledge, and culturally appropriate best practices for schooling, mental health, and more. Although COVID-19 is a global concern, its impacts may look differently within and across different countries; thus, an internationalization framework for research can help researchers, service providers, and policy makers to understand, for example, how different countries are attempting to evaluate and address psychological and educational impacts—and to what extent can we learn from other nations’ efforts to minimize harmful effects of mandatory quarantine on psychoeducational outcomes.

Until more abundant research is available, converging evidence in the past year offers one clear implication: because quarantine conditions are negatively impacting large percentages of children and families, immediate and evidence-informed actions must be used to remediate or at least slow the widespread, negative, psychoeducational impacts. In numerous ways, psychologists and educators can help in this effort, including efforts to assist students with dyslexia and their

families. For example, professionals can work to implement virtual interventions if face-to-face intervention is not possible or feasible—and in doing so, aim to select interventions that have contextually appropriate evidence of being effective (at least within face-to-face contexts if virtual implementation has not yet been tested) and closely attend to intervention effectiveness at the individual level so that treatment adjustments can be made immediately to best support the individual. Intervention or prevention efforts must also consider multiple aspects of students’ learning or psychological wellbeing, such as by offering guidance for students’ teachers within schools and, when appropriate, for parents in home. As evidenced in numerous studies well before COVID-19 (e.g., Soriano-Ferrer et al., 2011), intervention may need to be individualized or intensified for students with dyslexia.

Indeed, a rapid and focused effort on prevention, intervention, and careful evaluation of intervention effectiveness is greatly needed at an unprecedented time that currently lacks the needed amount of research-informed guidance. Although “basic” needs (e.g., food, water, safety from the coronavirus, suitable healthcare) are essential during a time of crisis, we argue that psychoeducational needs are equally essential and that local schools, national governments, and global agencies must do even more to provide needed and equitable supports. These supports are even more critical to students with learning difficulties and those who do not have access to equitable educational conditions (e.g., those limited by economic disadvantages).

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by University of Valencia. Written informed consent to participate in this study was provided by the participants’ legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

MS-F have contributed to the conception and design of work, to interpretation of data, drafting the manuscript and revising it critically for important intellectual content, a final approval of the version to be published, and to agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. JB have contributed to analysis and interpretation of data, drafting the manuscript or revising it critically for important intellectual content, a final approval of the version to be published, and to agreement to be accountable for all aspects of the work in ensuring that questions related to the

accuracy or integrity of any part of the work are appropriately investigated and resolved. MM-S and EP-M have contributed to acquisition of data, to interpretation of data, drafting the manuscript or revising it critically for important intellectual content, a final approval of the version to be published, and to agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and

resolved. All authors contributed to the article and approved the submitted version.

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Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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3.- DISCUSION GENERAL

Nuestro **primer objetivo** de investigación (estudio 1) pretendía examinar si existen diferencias en diferentes dominios (es decir, cognitivo, conductual y emocional) del funcionamiento ejecutivo de los niños y adolescentes con dislexia en comparación con niños y adolescentes con desarrollo típico a partir de las estimaciones conductuales de padres y profesores.

Nuestros resultados muestran que los niños y adolescentes con dislexia son evaluados por padres y profesores como significativamente peores en funcionamiento ejecutivo que los controles con desarrollo típico en casi todas las subescalas e índices del BRIEF-2. Así, tanto las valoraciones de los padres como las de los profesores reflejaron mayores diferencias en el deterioro para los alumnos con dislexia en comparación a los alumnos con desarrollo típico en el dominio cognitivo (por ejemplo, iniciación, memoria de trabajo, planificación-organización, supervisión de tareas, organización de materiales, así como en el índice de regulación cognitiva), en el dominio conductual (por ejemplo, auto-monitoreo y en el índice de regulación conductual) y en el dominio emocional (por ejemplo, control emocional, y en el índice de regulación emocional) y en el índice global ejecutivo. Sin embargo, los padres informaron de más dificultades de inhibición (dominio conductual), mientras que los profesores informaron de más dificultades de cambio (dominio emocional) entre los alumnos con dislexia.

Aunque nuestros hallazgos de los padres fueron consistentes con el pequeño número de estudios previos que examinaron la función ejecutiva de niños y adolescentes con dislexia (Gioia et al., 2002b; Locascio et al., 2010; Schöfl et al., 2014), también los maestros identificaron diferencias adicionales entre los grupos de dislexia y desarrollo

típico. Este hallazgo es novedoso, ya que no existen estudios previos que hayan empleado estimaciones de profesores.

En relación a los acuerdos y desacuerdos entre las puntuaciones de función ejecutiva otorgadas por los padres y los profesores, hay que destacar que entre nuestros resultados encontraron indicadores significativos, tanto de acuerdo como de desacuerdo en las valoraciones. En cuanto a los acuerdos entre las puntuaciones otorgadas por los padres y los profesores, los coeficientes de correlación fueron de moderadas a altas y estadísticamente significativos en todas las escalas e índices del BRIEF-2. Estos resultados son consistentes con los encontrados con una muestra normativa por Goia et al. (2015, 2017), posiblemente porque los cuestionarios del BRIEF-2 de padres y profesores comparten el 85% de los ítems. Sin embargo, al realizar los análisis dentro de cada grupo, las correlaciones fueron moderadas solo en algunas subescalas en cada uno de los grupos.

Nuestros análisis de discrepancias entre informantes, padres versus maestros, señalan que fueron los maestros los que informaron de más dificultades ejecutivas en la mayoría de las escalas e índices en los alumnos con dislexia en comparación con los estudiantes con desarrollo típico, aunque solo se encontraron diferencias significativas en memoria de trabajo, y en el índice de regulación cognitiva. Este dato se ve refrendado por el hecho de que los profesores consideran que solo un pequeño porcentaje de participantes ($n=1-10$) con dislexia superaba las puntuaciones clínicas de corte en los ámbitos conductual (p. ej., inhibición, autocontrol) y emocional (p. ej., cambio, control emocional). En resumen, los profesores informaron de una mayor variedad y gravedad de deficiencias de función ejecutiva entre los alumnos con dislexia que sus padres.

Por lo tanto, estos desacuerdos entre los informantes podrían ser el resultado de diferencias intersituacionales en el comportamiento de los niños o adolescentes, o

diferencias en las percepciones y expectativas de los informantes. En este contexto, nuestros resultados pueden sugerir que la formación y la familiaridad de los maestros con el comportamiento adecuado a la edad les permite reconocer más fácilmente las dificultades en el ámbito de la función ejecutiva, y pueden tener más oportunidades de hacer comparaciones adecuadas a la edad. Además, es probable que el entorno escolar sea más estructurado y menos flexible que el entorno familiar. En la escuela, los niños y adolescentes deben regular y controlar su comportamiento, planificar y organizarse para las tareas actuales y futuras, y utilizar la memoria de trabajo para completar tareas y resolver problemas. En cambio, el entorno familiar puede ser más complaciente y tolerante con las deficiencias de función ejecutiva.

Nuestro **segundo objetivo** (estudios 2, 3 y 4) trata de analizar los problemas de interiorización y exteriorización en niños y adolescentes con dislexia, así como el impacto que la dislexia puede tener sobre la familia. Específicamente, en el estudio 2, analizamos algunos problemas de salud mental con autoinformes para los adolescentes con dislexia, así como los problemas internalizantes y externalizantes de dichos alumnos mediante el empleo de escalas de estimación comportamental para padres y profesores. Hasta donde sabemos, este estudio es el primero que examina los problemas internalizantes y externalizantes en adolescentes españoles con dislexia, utilizando diferentes fuentes de información como los autoinformes y las valoraciones de los padres y profesores. Nuestros resultados confirman que, tanto los autoinformes de los propios adolescentes como los cuestionarios de los padres y profesores, informaron de que los adolescentes españoles con dificultades lectoras obtuvieron valores medios más altos de problemas internalizantes (p. ej., ansiedad estado, depresión, problemas emocionales), externalizantes (p. ej., problemas de conducta, inatención-hiperactividad) y problemas totales que el grupo de comparación

con desarrollo típico. Además, las puntuaciones de un mayor número de adolescentes con dislexia se encontraban por encima del punto de corte clínico. Nuestros resultados concuerdan con los de estudios previos que muestran que la dislexia es una condición de riesgo para los problemas de interiorización y exteriorización (p.e. Boyes et al., 2016; Carroll et al., 2005; Dahle y Knivsberg, 2014; Francis et al., 2019; Halonen et al., 2006; Lee y Bukouski, 2012; Mammarella et al., 2016; Morgan et al., 2008; Nelson y Harwood, 2011 a, b; Zuppardo et al., 2023), especialmente durante la adolescencia (Avenevoli et al., 2008; Giovagnoli et al., 2020; Mugnani et al., 2009).

En el estudio 3, analizamos los niveles de estrés parental y los estilos de crianza empleados por los padres de adolescentes con dislexia, en comparación con los padres de adolescentes con desarrollo típico. Nuestros datos confirmaron que los padres de adolescentes con dislexia experimentan mayores niveles de estrés en general. Además, experimentan mayores niveles de angustia parental y más interacciones problemáticas, y perciben a su hijo con dislexia como más difícil de criar, en comparación con los padres de adolescentes con desarrollo típico. Este resultado ha sido confirmado previamente por otros estudios que también han encontrado niveles más altos de estrés parental en familias de niños y adolescentes con dislexia (Auriemma et al., 2021; Bonifacci et al., 2014; Delany, 2017; Fernández-Alcántara et al., 2017; Sanowling et al., 2007).

Un resultado novedoso es que los padres de adolescentes con dislexia también emplean prácticas educativas disfuncionales, especialmente la reactividad excesiva y el autoritarismo, en mayor medida que los padres de adolescentes con desarrollo típico, posiblemente porque tienen que hacer frente a un pobre progreso académico, a una mayor necesidad de ayuda con los deberes y a la búsqueda de una enseñanza adecuada o de apoyo a la lectura en la etapa adolescente.

En el estudio 4, dado que durante la realización de esta tesis se produjo la pandemia por Covid-19 y estuvimos confinados, pretendía analizar los problemas de interiorización y exteriorización en adolescentes con dislexia, así como el impacto que la dislexia podía tener sobre la familia durante el confinamiento. Así, los estudiantes con dislexia incrementaron durante el confinamiento sus síntomas depresivos y de ansiedad estado, algunos incluso por encima del rango clínico (12.5% en depresión y 81.3% en ansiedad), Asimismo, sus padres informaron de un incremento de problemas emocionales, problemas de conducta y síntomas de inatención e hiperactividad. En relación, al impacto que la dislexia producía en el contexto familiar, las madres informaron de mayor estrés en general, así como mayor malestar psicológico, interacción con su hijo con dislexia más disfuncional, y una percepción de “mucho más difícil” de su hijo con dislexia, aspecto que había sido señalado por familias italianas de alumnos con dislexia (Spinelli et al., 2020) posiblemente porque durante el confinamiento los padres tuvieron que lidiar con el confinamiento y tratar de equilibrar factores como la vida personal, el trabajo y la educación de los hijos.

En relación a los aspectos educativos, aproximadamente el 90% de los padres afirmaron disponer de dispositivos electrónicos para el aprendizaje a distancia, aunque el 71.9% también informó de que dichos dispositivos electrónicos eran compartidos por otros miembros de la familia, como hermanos y padres. En relación con el aprendizaje a distancia, el 100% de los profesores utilizó tareas en línea a través de software como Moodle, pero sólo el 21.9% ocasionalmente asistió a sus clases en línea con un profesor presente. Los padres informaron de que el 56.2% de los jóvenes con dislexia dedicaban menos de 4 h al día al aprendizaje y el 43.8% pasaba entre 4 y 7 h. Además, el 56.3% de los niños con trastorno específico de la lectura utilizaban audiolibros y/o lectores para

completar las actividades escolares de lectura. Todos los padres de niños con trastornos de la lectura informaron de dificultades para establecer rutinas de estudio y realizar los deberes. De hecho, el 100% de los padres indicaron que su hijo necesitaba ayuda con los deberes. La mayoría de los padres (90.6%) dedicaba más de 3 h al día para ayudar a sus hijos en el aprendizaje y el 96.9% indicaron que la pandemia había afectado negativamente al aprendizaje de sus hijos. Del mismo modo, el 68.9% de los padres que tenían dificultades para cooperar con los profesores de sus hijos y que su hijo tenía dificultades para completar las tareas a tiempo. La gran mayoría (78.1%) de los padres indicaron que su hijo con trastorno específico de la lectura recibió menos apoyo para las dificultades de lectura durante el confinamiento, y el 21.9% señaló que el niño no recibía ninguna atención especial por sus dificultades con la lectura. Por último, la mayoría de los padres estaban muy preocupados por el aprendizaje y el éxito escolar del niño (100%), su motivación y el interés del niño por la lectura y el aprendizaje (84.4%), las relaciones con sus compañeros (78.1%) y las aptitudes profesionales del profesor de su hijo (71.9%).

Nuestro **tercer objetivo** (estudios 2 y 3) trata de analizar el impacto que una de las comorbilidades más frecuentemente asociadas a la dislexia, el trastorno por déficit de atención con hiperactividad (TDAH) subtipo combinado, podría tener en los adolescentes con dislexia y en sus familias. En este sentido, los resultados del estudio 2 y del estudio 3 no dejan lugar a dudas de que la presencia comorbida de dislexia + TDAH subtipo combinado representa un riesgo adicional, tanto para los adolescentes como para sus familias. En concreto, los hallazgos del estudio 2 muestran que los adolescentes del grupo Dislexia + TDAH-Combinado presentaron los mayores problemas internalizantes y externalizantes según las valoraciones de los padres y profesores, ya que, como se concluye en la revisión de estudios previos, la comorbilidad con TDAH es uno de los principales factores de riesgo (Mugnani et al., 2009). Sin embargo, nuestros resultados con las medidas

de autoinforme de los adolescentes no mostraron diferencias entre los dos grupos con dificultades lectoras, con y sin TDAH asociado. Esta falta de diferencias entre los dos grupos se debe posiblemente a la fuerte evidencia de que una proporción sustancial de estudiantes con trastorno por déficit de atención con hiperactividad (TDAH) tienden a hacer evaluaciones más positivas de sus propias capacidades en relación con otras evaluaciones externas. Es decir, los niños y adolescentes con TDAH parecen exhibir un sesgo de autovaloración, al no ser conscientes de sus patrones de pensamiento, sentimientos y conductas, por lo que sus autoinformes, a menudo, difieren de la evaluación que sus padres y profesores hacen de ellos, incluso con evaluaciones objetivas. Esta autoevaluación positiva puede persistir en la edad adulta (Colomer et al., 2016, 2020; Chan y Martinussen, 2016). Aunque estas discrepancias entre los autoinformes y las valoraciones de padres y profesores pueden considerarse errores de medición o sesgos del informante (De los Reyes, 2013), también pueden reflejar las verdaderas diferencias relacionadas con el entorno (por ejemplo, el hogar y la escuela) y/o diferencias en los conocimientos y experiencias del informante (Achenbach, 2011, 2017; De los Reyes, 2005).

Por su parte, los resultados del estudio 3 muestran que la presencia comórbida del subtipo combinado de TDAH y dislexia parece presentar un riesgo adicional para las familias, dado que los padres de adolescentes con dislexia +TDAH subtipo combinado experimentaron los niveles más altos de estrés parental en todos los dominios del índice de estrés parental. Es decir, experimentaban mayores niveles de angustia parental e interacciones más complicadas con sus hijos adolescentes, y percibían a sus hijos con dislexia y TDAH como mucho más difíciles de disciplinar. Así pues, los padres de adolescentes con el subtipo combinado de dislexia + TDAH no sólo superaban en estrés a las familias de adolescentes con un desarrollo típico, sino también a las familias con

hijos adolescentes con dislexia. Estos resultados apoyan los hallazgos previos que apuntaban a un mayor estrés en las familias de niños y adolescentes con el subtipo combinado de TDAH (Theule et al., 2013; Weiner et al., 2015; Weinberger et al., 2018), así como los hallazgos del único estudio comparativo de familias con niños con dislexia y familias con niños con TDAH, realizado por Bonifacci et al. (2019). Las razones por las que los padres de adolescentes con el subtipo combinado de dislexia + TDAH experimentan altos niveles de estrés probablemente tengan que ver con el hecho de que la adolescencia es una etapa de desarrollo complicada y que los adolescentes cuyos padres participaron en este estudio eran los que experimentaban mayores problemas de interiorización y exteriorización, según las estimaciones de padres y profesores como se observa en los resultados del estudio 2. Por lo tanto, los padres de estos adolescentes con problemas académicos y de conducta pueden haberse visto desbordados en su función educativa y haber sufrido agotamiento parental (Guo et al., 2024; Mikolajczak et al., 2018).

Otro aspecto a destacar es que los padres del grupo de adolescentes del subtipo comórbido con dislexia y TDAH combinados utilizan estrategias de crianza disfuncionales con mayor frecuencia que los padres de los otros dos grupos de adolescentes, es decir, los que tienen dislexia y los que tienen un desarrollo típico. En concreto, los padres de los adolescentes con dislexia + TDAH emplean con mayor frecuencia estrategias educativas permisivas y autoritarias, como la sobreactuación, posiblemente porque tienen que hacer frente tanto a los problemas académicos de la dislexia como a las dificultades para manejar las características conductuales asociadas al TDAH, especialmente en la etapa adolescente, cuando las dificultades académicas pueden haberse agudizado. Estudios previos ya habían confirmado el uso de estrategias de crianza más inadecuadas en familias de niños con TDAH, especialmente en el subtipo

combinado y cuando existen problemas de conducta asociados (Shelton et al., 1998; Miranda et al., 2007; Woodward et al., 1998).

En cada una de las 4 contribuciones que se presentan en esta tesis se presentan las limitaciones de los estudios, así como las implicaciones que tiene los resultados para la práctica.

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