



# VNiVERSIDAD D SALAMANCA

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DPTO. & ENFERMERÍA Y FISIOTERAPIA  
ÁREA & FISIOTERAPIA

Tesis Doctoral

## Evolución del razonamiento clínico del terapeuta ocupacional

Luis Javier Márquez Álvarez

Mayo de 2021





**VNiVERSiDAD  
D SALAMANCA**

Tesis Doctoral

**Evolución del razonamiento  
clínico del terapeuta  
ocupacional**

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Programa de Doctorado:

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De acuerdo con el RD 99/2011, de 28 de enero, por el que se regulan las enseñanzas oficiales de doctorado, la Comisión de Doctorado y Posgrado de la Universidad de Salamanca establece como posible formato de presentación de Tesis Doctoral la modalidad de Tesis por Compendio de Artículos/Publicaciones, publicados o aceptados en revistas especializadas. Así, la presente Tesis Doctoral se presenta bajo esta modalidad.

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D. José Ignacio Calvo Arenillas, Catedrático de la Escuela Universitaria de Enfermería y Fisioterapia de la Universidad de Salamanca, CERTIFICA:

Que la tesis titulada “**Evolución del razonamiento clínico del terapeuta ocupacional**”, realizado por D. Luis Javier Márquez Álvarez para optar al Grado de Doctor por esta Universidad, cumple todos los requisitos necesarios para su presentación y defensa ante el tribunal calificador.

Para que conste y en cumplimiento de las disposiciones vigentes, extendiendo el presente certificado con fecha 26 de mayo de 2021.

Fdo. José Ignacio Calvo Arenillas

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Que la tesis titulada “**Evolución del razonamiento clínico del terapeuta ocupacional**”, realizado por D. Luis Javier Márquez Álvarez para optar al Grado de Doctor por esta Universidad, cumple todos los requisitos necesarios para su presentación y defensa ante el tribunal calificador.

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Fdo. Pedro Moruno Miralles

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*A todas las familias con las que he trabajado.*

*Por su paciencia.*

*Por su visión.*

*Por su fuerza.*



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*“La lógica es maravillosa, pero a veces obtienes mejores resultados pensando.” Sir Terry Pratchett*

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*“Es la imaginación, no la inteligencia, lo que nos hace humanos.”*  
Sir Terry Pratchett

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## Presentación y diseño de la tesis

Esta Tesis Doctoral constituye un compendio de tres artículos científicos que giran en torno al análisis y desarrollo del razonamiento profesional del estudiante de terapia ocupacional. Aunque existe un corpus creciente con respecto a la evidencia de la naturaleza del razonamiento profesional, hay poca investigación empírica que examine directamente su desarrollo a lo largo de la formación académica.

La investigación desarrollada trata de determinar todos estos aspectos subyacentes para reconocer su importancia en la formación y adquisición de competencias profesionales, así como de crear profesionales con calidad asistencial. Los pasos necesarios para conseguir este hito vienen recogidos en las publicaciones anexas.

La Tesis Doctoral se organiza de acuerdo con las indicaciones reunidas en el *Procedimiento del 15 de febrero de 2013 para la presentación de la Tesis Doctoral en la Universidad de Salamanca en el formato de compendio de artículos/publicaciones*. Su estructura se organiza en siete secciones.

**Introducción y justificación:** en esta primera sección se presenta el marco teórico detallado que encuadra el presente trabajo. Su propósito es contextualizar y facilitar la comprensión de los principales constructos teóricos. Gracias a esto, es posible detallar las necesidades científicas y las actuales lagunas dentro de la investigación.

En primer lugar, se aborda el concepto de razonamiento profesional desde su primera mención dentro de la literatura de terapia ocupacional (1.1). Después se exponen las principales teorías actuales que reúnen la evidencia sobre los componentes de dicho razonamiento (1.2.1). Esta información intenta delimitar las fallas en los estudios más recientes con relación a estructura y contenido del pensamiento (1.2.2). Consecuentemente, es posible elaborar los conceptos más nucleares de la tesis, como es la evolución de las diferentes competencias necesarias por parte de los estudiantes de terapia ocupacional, sus influencias y los procesos de construcción de este (1.2.3).

**Objetivos:** en este capítulo se recoge el hito principal de esta Tesis Doctoral, así como los pasos necesarios para llegar hasta ello. Así, se presentan el objetivo general y una serie de objetivos específicos. Todos estos objetivos son propósito de estudio en las diferentes publicaciones científicas anexas.

**Fases de la investigación:** en esta división se describe el plan de investigación desarrollado en tres fases estructuradas. La articulación de estas fases se basa en la

argumentación de las diferentes fallas del campo de estudio. Estas ideas siguen una secuencia lógica, primero delimitando el campo de conocimiento actual para luego abordar en detalle los sesgos más característicos encontrados.

**Publicaciones científicas:** en esta parte se recogen las tres publicaciones científicas que constituyen el eje central de este trabajo. El primer artículo realiza una revisión de la literatura para identificar y describir las publicaciones científicas sobre razonamiento profesional y para analizar el desarrollo histórico de esta área de investigación. El segundo artículo trata de identificar el rango de perspectivas de los estudiantes de terapia ocupacional acerca de los términos o conceptos que son clave para mejorar su razonamiento profesional. El tercer artículo analiza el razonamiento diagnóstico y sus cambios durante su educación en los estudiantes de terapia ocupacional.

Las investigaciones referentes al desarrollo de los diferentes proyectos de investigación de la presente tesis han sido aprobadas por:

- El Comité Institucional de Revisión de Ética Humana de la Facultad de Salud de la Universidad del Valle (VRI/1772).
- La Red Gallega de Comités de Ética de la Investigación (2014/399).
- Los Comités Éticos de los Hospitales de Castilla-La Mancha (2014/036).
- El Comité Ética de la Investigación del Principado de Asturias (2020.532).

**Propuestas de mejora:** en este breve epígrafe se incorpora una serie de propuestas de mejora para futuras líneas de investigación basadas en los resultados y limitaciones de los estudios realizados.

**Conclusiones:** en este apartado se incluyen las conclusiones específicas en relación con los hallazgos realizados durante el proceso de la tesis. Estos hallazgos dan respuesta a los diferentes objetivos del estudio y a la propuesta de objetivo global.

**Anexos:** en los que se detallan diferentes méritos realizados con relación al desarrollo de las diferentes investigaciones que constituyen el cuerpo de la tesis, a entender, aportaciones a congresos, publicaciones y actividad docente relacionada.

# 1. Introducción y justificación del trabajo

### 1.1. Objeto de estudio

El razonamiento clínico o profesional en terapia ocupacional es definido como el proceso utilizado por los profesionales para planificar, dirigir, ejecutar y reflexionar sobre el cuidado del cliente (B. A. B. Schell, 2008, 2009; B. A. B. Schell & Schell, 2017). Su importancia en la práctica profesional recae en la habilidad del profesional para gestionar el proceso de evaluación, planificación e implementación de la intervención, influyendo en la efectividad del trabajo realizado (Talavera Valverde, 2015). Obviamente, constituye un elemento esencial de la práctica de la profesión y en la formación de los estudiantes de terapia ocupacional.

Cabe señalar que, como tal, el término “clínico” -en la locución “razonamiento clínico”- suele relacionarse con un enfoque médico o contextos clínicos. Este uso ha dado lugar a la discusión que Schell describe en su obra, señalando que el razonamiento del terapeuta sucede en otros entornos no médicos, como en escuelas o intervenciones en la comunidad, u orientado a funciones de supervisión, educación, o administración, que también forman parte de la práctica profesional del terapeuta ocupacional (B. A. B. Schell, 2008). Por este motivo, la vertiente más actual recoge el uso de razonamiento profesional como un término más contemporáneo y expansivo, término que se reproducirá a lo largo de la presente tesis.

Las descripciones y definiciones más recientes del razonamiento profesional han sido influenciadas por la diversidad de naturalezas y objetivos de la práctica de la terapia ocupacional, la filosofía de la profesión en sí misma y las diversas epistemologías llevadas a cabo por los investigadores de manera individual (Chapparo & Ranka, 2000).

Actualmente, el razonamiento profesional se conceptualiza como un modo de pensamiento tácito, altamente imaginativo y profundamente fenomenológico (Chapparo & Ranka, 2000). En terapia ocupacional, este modo de pensar facilita determinar aquello que es mejor para cada cliente de manera particular (Mattingly & Fleming, 1994, p. 13). Para llegar a ello, surge el resultado del proceso de pensamiento, esto es, el resultado de la interacción entre la persona, el contexto y los diferentes objetivos o tareas que debe alcanzar. La individualidad que fundamenta cada una de estas características se suma a la individualidad del propio profesional, que modula la intervención en base a sus propias creencias, expectativas y conjeturas. Así, el terapeuta modifica su conducta para llevar a cabo una u otra intervención, influida por este razonamiento. (Chapparo, 1997).

Desde una perspectiva histórica, el estudio del razonamiento profesional ganó presencia en la profesión de terapia ocupacional cuando Joan Rogers lo hizo objeto de su AOTA Eleanor Clark Slagle Lecture (Rogers, 1983; Rogers & Masagatani, 1982). Rogers se inspiró en la investigación emergente en el ámbito de la medicina y la psicología cognitiva, que intentaba explicar cómo se tomaban las decisiones clínicas en medicina. Esto llevó a replicar un estudio en una población de terapeutas ocupacionales (Rogers & Masagatani, 1982). En dicho estudio, halló que los terapeutas eran incapaces de explicar por qué hacían lo que hacían. Por ello, planteó que difícilmente podremos mejorar nuestras acciones terapéuticas, ni mucho menos enseñarlas, si no somos capaces de describir el proceso que subyace a ellas (Rogers, 1983).

Este análisis generó unos resultados iniciales de impacto, que ayudó a crear la dotación de una beca por parte de la Fundación Americana de Terapia Ocupacional para profundizar en su estudio (Gillette & Mattingly, 1987). Desde entonces, ha sido una de las líneas de investigación en terapia ocupacional más fructíferas y constantes a lo largo de la historia de nuestra disciplina (Márquez-Álvarez et al., 2019; Unsworth & Baker, 2016).

Dado que el razonamiento engranado en la práctica profesional es un proceso complejo, no es difícil encontrar diferentes perspectivas sobre su naturaleza, tanto en el proceso como en el contenido del mismo (B. A. B. Schell, 2009). De manera clásica, se suele decir que el razonamiento profesional del terapeuta ocupacional se organiza en torno a un pensamiento de tres pistas o *three-track mind* (Fleming, 1991b), distinguiendo entre razonamiento procesal, interactivo y condicional. Esto quiere decir que las diversas estrategias de pensamiento del profesional cumplen funciones diferentes en función de la situación y los datos recabados.

La investigación aumentó progresivamente con el paso de los años, mostrando la diversidad del contenido del pensamiento vinculada con la evaluación e intervención con el cliente. De esta forma surgen las diferentes modalidades del razonamiento conocidas actualmente (Tabla 1). El terapeuta ocupacional se apoya en todas las modalidades del razonamiento profesional para categorizar la información relacionada con el cliente. Los datos recogidos se vinculan con los posibles problemas del desempeño y permiten valorar posibles intervenciones, para proponer un plan de trabajo y llevar a cabo una intervención con el usuario dentro de los márgenes ético-morales (Talavera Valverde, 2015).

Aspecto del razonamiento	Estrategias del terapeuta ocupacional
Procesal	El terapeuta identifica el origen de las alteraciones como las estrategias adecuadas para resolverlas. Gracias a sus conocimientos teóricos y a la experiencia acumulada, crea y utiliza guiones como guía.
Interactivo	Dirigido a captar la experiencia de la discapacidad desde el punto de vista de la persona, favoreciendo la implicación del usuario en la intervención.
Condicional	Combinación de todas las formas de razonamiento con la finalidad de responder a las condiciones cambiantes o predecir los cambios en la persona. Se construye sobre una imagen de un posible futuro.
Narrativo	Proceso utilizado para dar cabida a circunstancias particulares de las personas e imaginar el efecto de la enfermedad, discapacidad o problemas de desempeño en la vida diaria. Crea una historia entre los implicados en el proceso (usuario, familia, profesional).
Diagnóstico	Implica el uso de métodos científicos, como pruebas, reconocimiento de patrones o toma de decisiones, para crear el razonamiento. Es un proceso mental que aúna formas de relación con la persona, desde la literatura científica hasta la información obtenida por el usuario.
Pragmático	Se enfoca a todo aquello que rodea la intervención entre el profesional-usuario, buscando encajar las posibilidades que la terapia ocupacional puede aportar en función de la situación existente.
Ético	Forma dirigida a analizar dilemas éticos, conflictos morales, del servicio de terapia ocupacional.

Tabla 1. Modalidades de razonamiento profesional del terapeuta ocupacional

En síntesis, comprender la complejidad del razonamiento profesional, sus modalidades y características ayuda tanto a estudiantes como a titulados a desarrollar y mejorar las competencias profesionales relacionadas con la adquisición de pericia (*expertise*). Esta pericia se relaciona de manera directa con la formación de profesionales de calidad, capaces de asumir retos y realizar intervenciones con resultados efectivos.

Aunque existe un corpus de conocimiento creciente sobre la naturaleza del razonamiento profesional del terapeuta ocupacional, hay poca investigación empírica que examine directamente su desarrollo a lo largo de la formación académica.

Es bien sabido que el razonamiento profesional es una competencia central que los profesionales y estudiantes desarrollan fundamentalmente con la experiencia (Chapparo & Ranka, 2000; Slater & Cohn, 1991). Sin embargo, adquirir e integrar el conocimiento teórico adquirido durante los años de formación académica con la experiencia adquirida en la práctica es un desafío clave para el desarrollo de la profesión (Hocking & Ness, 2002; World Federation of Occupational Therapists, 2016). De cara a un trabajo multidisciplinar, la expectativa laboral

supone que las nuevas promociones de estudiantes alcanzan unos mínimos en el grado sobre las destrezas y habilidades necesarias en un entorno sanitario complejo y cambiante (Furze et al., 2015; Henderson et al., 2017; McCannon et al., 2004; Scaffa & Wooster, 2004). Por ello, el desarrollo del razonamiento profesional de los estudiantes en formación es un componente crítico para los programas educativos en terapia ocupacional.

Su estudio se ha vuelto clave para identificar las necesidades básicas de aprendizaje, ya que estas permite lidiar con los cambios constantes de la práctica, con los desafíos en relación con las expectativas o necesidades del cliente y adaptarse a la creciente provisión de servicios para las personas con discapacidad en diferentes contextos institucionales (Maruyama et al., 2021). Muchos educadores e investigadores han debatido a lo largo de los años, sin llegar a un consenso, sobre cómo facilitar o incluso medir el desarrollo del razonamiento profesional (Bolton & Dean, 2018; Johnson et al., 2017; Maloney & Griffith, 2013; Naber & Wyatt, 2014; Seif et al., 2014; Unsworth & Baker, 2016).

Slater & Cohn (1991) fueron los primeros en tratar conceptualizar la adquisición de la maestría o pericia profesional en el cuerpo profesional de terapeutas ocupacionales. Para ello, aplicaron el modelo descrito por Dreyfus & Dreyfus (1980), describiendo una adquisición de competencias jerárquica y estrechamente vinculada con el tiempo invertido en formación práctica. La investigación asume que normalmente lleva un mínimo de 10 años para los individuos ganar pericia en un campo (Jensen et al., 2019; Schmidt & Boshuizen, 1993; Simon, 1980). Aunque los cambios están presentes como una jerarquía dependiente de años de experiencia, es importante reconocer que el desarrollo es dinámico e influenciado por muchos factores, más allá de los propios años de experiencia. Tanto el recorrido personal como profesional, junto con una reflexión activa, son críticos para volverse un experto (B. A. B. Schell, 2009; Slater & Cohn, 1991).

La perspectiva actual recoge de manera muy esquemática la evolución entre novato (*novice*) y experto (*expert*). De acuerdo a la revisión sistemática de Unsworth y Baker (2016), no existe acuerdo en la literatura en las definiciones de lo que se puede considerar un novato o un experto. De hecho, parece que incluso algunos terapeutas ocupacionales parecen no alcanzar nunca la calificación de experto (Bolton & Dean, 2018). Tanto desde una aproximación teórica como investigadora, se enfatiza que una disciplina debe determinar qué habilidades son necesarias para la comprensión de su propio conocimiento y que éste pueda compartirse explícitamente con los estudiantes (Huber & Kuncel, 2016; Pitonyak et al., 2020; Schaber, 2014; Schaber & Shanedling, 2012).

Sin embargo, autores como Pitonyak et al. (2020), recogen que existe una escasez de conocimiento consensuado sobre la naturaleza, características y habilidades básicas asociadas al razonamiento del profesional en nuestra disciplina. La razón parece fundamentarse en la profesión en sí, ya que la terapia ocupacional es una disciplina sociosanitaria centrada en el cliente, con poco énfasis en el proceso de pensamiento del terapeuta. En lugar de establecer una base teórica fundamentada en estos procesos, la profesión continúa expandiéndose. Así, surgen nuevos campos de práctica, aumentando el sesgo relacionado con esta falta de fundamento teórico.

Todas estas circunstancias han tenido una repercusión en la estructura de los planes de estudio de terapia ocupacional. La formación teórica y práctica que da forma a tales planes se ha diversificado ampliamente, incorporando aspectos específicos vinculados con nuevos desarrollos teóricos y ámbitos de práctica. De esta forma, el foco de la capacitación de los estudiantes en formación se centra en competencias específicas vinculadas a campos de práctica diversos, en detrimento de la adquisición de conocimientos, competencias y habilidades genéricas y transversales propias de la disciplina. En definitiva, la evolución del razonamiento profesional del terapeuta ocupacional está quedando relegada a la adquisición de un competencia aislada, en lugar de ser estudiada en profundidad (Hocking & Ness, 2004; World Federation of Occupational Therapists, 2016).

En conclusión, el desarrollo del razonamiento profesional debe ser considerado como un componente crítico del plan de estudios, central en su formación. El aprendizaje a través de la práctica provee de oportunidades para emplear su conocimiento teórico adecuándolo a un contexto, pero no es definitorio en la adquisición de un razonamiento profesional experto. La importancia de su evolución es lo que define una práctica de terapia ocupacional de calidad. Sin embargo, no existe todavía un conocimiento asentado y unificado sobre los diferentes constructos y cómo pueden ser aplicados de manera efectiva y eficaz en el ámbito educativo de la disciplina.

### 1.2. Justificación del estudio

El razonamiento profesional incluye un conocimiento tácito inmerso en la experiencia de la práctica, difícil de verbalizar y enseñar (Mattingly & Fleming, 1994; Unsworth, 2001a, 2001b). La vertiente actual de la investigación considera que el razonamiento profesional debe ser considerado como una co-construcción, un proceso subjetivo en el que colaboran tanto educadores como estudiantes (Mattingly & Fleming, 1994; B. A. B. Schell & Schell, 2017; Unsworth, 2004). Sin embargo, como se detalló previamente, determinar la totalidad de este

proceso requiere un campo definido, sobre el cual todavía no se ha adquirido evidencia científica concluyente (Maruyama et al., 2021).

Identificar las destrezas básicas para el razonamiento profesional del terapeuta ocupacional permitiría mejorar la calidad de la intervención de los profesionales. Además, para poder formar profesionales cada vez más competentes sería necesario detallar cómo las competencias se van adquiriendo o no a lo largo de los años, considerando la potencialidad y variabilidad personal. Consecuentemente, sería posible modificar los planes de estudios de los estudiantes, para favorecer la adquisición de diferentes competencias con relación a su desarrollo personal y formación académica, formando profesionales de calidad.

Todas estas cuestiones derivan en una necesidad prioritaria de determinar de manera conjunta la comprensión de qué denominamos razonamiento profesional (Maruyama et al., 2021), sus componentes esenciales (D. Robertson et al., 2015; Schwartz, 1991) y sus modalidades o tipos (Barnitt & Partridge, 1997; Lysaght & Bent, 2005), para poder lograr la construcción de un camino coherente y uniforme en la enseñanza y en la creación de profesionales de calidad.

En el siguiente epígrafe describiremos con detalle la investigación actual sobre la naturaleza del razonamiento profesional y sus componentes básicos, con el objetivo de entender el proceso de co-construcción que tiene lugar durante la formación académica. Nos detendremos, en primer lugar, en la caracterización de los componentes implicados en el aprendizaje del razonamiento profesional en terapia ocupacional. En segundo lugar, describiremos cómo influye la variabilidad individual, es decir, las características personales del estudiante en el proceso de adquisición del razonamiento. Por último, analizaremos las variables relacionadas con la evolución del proceso de aprendizaje.

### *1.2.1. Componentes implicados en el aprendizaje del razonamiento profesional*

Hablar sobre los componentes del razonamiento profesional implica comprender las limitaciones de este campo de estudio. La adquisición del razonamiento profesional durante la formación académica todavía no está plenamente explorada. En la literatura, existen algunos modelos que identifican diversas variables, como la experiencia práctica, las características personales, el conocimiento teórico sobre la disciplina o el contexto cultural. Profundizar en el análisis de estos aspectos y su influencia en la adquisición del razonamiento profesional y, en definitiva, definir el campo de estudio, podría aportar una mayor comprensión del proceso de aprendizaje y mejora de las destrezas asociadas al aprendizaje del razonamiento profesional del terapeuta ocupacional.



La primera teoría descrita en la literatura fue desarrollada por Rogers tras su primer estudio (Rogers & Masagatani, 1982), donde describía el razonamiento profesional durante la evaluación ocupacional siguiendo una secuencia compuesta de seis etapas. No obstante, la dificultad de la población de terapeutas para realizar un análisis en profundidad de sus acciones no le permitió analizar tanto los propios componentes del razonamiento sino como su contenido, con una alta carga descriptiva. Esto llevó a que las autoras describieran un proceso de pensamiento centrado en el paciente y en la interacción terapeuta-paciente, pero muy determinado por el diagnóstico médico y el marco de referencia que circunscriben la evaluación.

Posteriormente Robertson (2013) elabora una formulación teórica del razonamiento profesional articulada en torno a tres mecanismos básicos implicados en el aprendizaje:

- a) Por un lado, el procesamiento teórico de la información: esta estructuración teórica provee un marco en el que pensar sobre los procesos de razonamiento, y permite identificar los vacíos (*gaps*) de estos procesos. “*Si sé cómo debo pensar, debería pensar como sé*”, sería la idea que lo resume de manera general.
- b) En segundo lugar, un supuesto procesamiento de información universal: este mecanismo se basa en la afirmación de Roberts (1996) de que el aumento de investigación ha derivado en la confusión entre “proceso” del pensamiento y “contenido” del pensamiento, que a su vez ha provocado que algunos componentes descriptores como determinados aspectos del razonamiento hayan sido calificados como parte del proceso de razonamiento. Robertson propone la existencia de un proceso universal subyacente de resolución de problemas basado en la adquisición y procesamiento de pistas (*cues*) y una propuesta de solución. El razonamiento profesional del estudiante mejora conforme avanza en sus estudios porque facilita la identificación de pistas o la argumentación para proponer abordajes e intervenciones.
- c) En último lugar, la definición de los resultados del propio razonamiento, elaborados en la formulación de un diagnóstico ocupacional: la manera concreta en que el problema se representa en la mente del terapeuta es un aspecto crítico del razonamiento y su aprendizaje. La representación cognitiva que aporta el diagnóstico ocupacional estructura el escenario sobre qué problema abordar y los objetivos que se van a plantear (Rogers, 2009). En este sentido, el desarrollo de un diagnóstico ocupacional dentro de la resolución de problemas que constituye el mecanismo de razonamiento profesional durante

la evaluación, circunscribiendo las necesidades elementales del aprendizaje del estudiante o terapeuta ocupacional, dando forma a su interpretación de cada caso abordado.

J. Schell (2018) describe un modelo de enseñanza del razonamiento profesional que difiere en gran medida del planteado por Robertson (2013). Para él, el aprendizaje del razonamiento profesional se articula en un proceso cíclico, sin una secuencia predeterminada, con unos componentes totalmente diferentes de los anteriores. El Modelo de Enseñanza del Razonamiento Profesional Basado en el Contexto (*Context-Based Teaching Model for Professional Reasoning*) describe cuatro componentes, relacionados más con componentes del proceso de aprendizaje que con componentes del razonamiento en sí mismo. En primer lugar, están las experiencias compartidas en contextos auténticos o relevantes, basadas en el aprendizaje contextual o vivencial. En segundo y tercer lugar, el proceso de co-construcción y la articulación del conocimiento, componentes derivados de teorías constructivistas a nivel cognitivo, que permiten alcanzar pensamientos superiores y reflexión para generar nuevas oportunidades de aprendizaje. En cuarto lugar, la reflexión sistemática sobre el significado, el razonamiento y la práctica, como medio de sostener un pensamiento crítico y el uso de evidencia científica de calidad como elementos clave para el razonamiento profesional.

Sinclair (2004) desarrolla un modelo que puede ser entendido como un puente entre ambos puntos de vista, llegando a la conclusión de que los componentes que influyen en el razonamiento profesional de los estudiantes son los que permiten crecer en términos de pericia profesional, hasta alcanzar el grado de expertos. Para ella, los componentes que constituyen su Matriz de Razonamiento Clínico (*Sinclair Matrix of Clinical Reasoning*) son el descubrimiento de la evidencia; la detección, formulación y definición del problema; la aplicación de la teoría; el desarrollo de conocimiento y conceptos; la toma de decisiones; la evaluación, planificación, priorización y predicción sobre el cliente; el enfoque de intervención; el juicio reflexivo, y la ética.

Teniendo en cuenta las variables anteriormente expuestas en cada modelo, todas constituyen de alguna u otra manera el contenido o la estructura que regulan la adquisición del razonamiento profesional a lo largo de la formación académica. Sin embargo, como se mencionó previamente, las teorías acerca de estos componentes sobre el razonamiento profesional son múltiples y no parecen mostrar un consenso claro. La Tabla 2 resume estas principales teorías en la adquisición de competencias en la formación del estudiante de terapia ocupacional.

<b>Modelo</b>	<b>Componentes del razonamiento</b>
<b>Rogers</b> (Razonamiento solo durante la evaluación)	Paciente
	Información previa (diagnóstico médico, lista de problemas estándar)
	Interacción paciente-terapeuta
<b>Robertson</b>	Conocimiento de la teoría sobre el procesamiento de la información
	Procesamiento de información universal
	Resultado del proceso de razonamiento
<b>J. Schell</b>	Experiencia compartida
	Co-construcción del conocimiento
	Articulación del conocimiento
	Reflexión sistemática
<b>Sinclair</b>	Descubrimiento de la evidencia científica
	Detección, formulación y definición del problema
	Aplicación de la teoría
	Desarrollo de conocimiento y conceptos
	Toma de decisiones
	Evaluación, planificación, priorización y predicción sobre el cliente
	Enfoque de intervención
Juicio reflexivo	
Ética	

Tabla 2. Síntesis de los principales modelos explicativos sobre el razonamiento profesional relacionadas con la formación del terapeuta ocupacional

### 1.2.2. Características personales del estudiante en el proceso de aprendizaje

De nuevo, cabe resaltar la importancia que tiene la variabilidad individual en la adquisición del razonamiento profesional en los estudiantes. Los estudios más recientes afianzan que la comprensión y razonamiento del estudiante universitario es un reflejo de las estrategias de aprendizaje y enseñanza del profesor, en tanto que el propio razonamiento profesional está condicionado por las influencias culturales del alumno y los propios estilos de aprendizaje (Sinclair, 2004). Estos datos vuelven a reflejar la idea de la co-construcción del razonamiento entre docente y estudiante, co-construcción en la que la individualidad es una variable clave añadida. Es decir, que no se habla sólo de una serie de variables vinculadas a las circunstancias personales del alumno, sino también las del propio docente. El producto final del razonamiento estará determinado por una estructura construida en conjunto, variable en función de las características personales de ambos. Sin embargo, todavía no está delimitado qué características afectan y su influencia en el proceso.

Algunos estudios reflejan la capacidad de los estudiantes de terapia ocupacional para estructurar su pensamiento en la resolución de casos prácticos empleando los conceptos

teóricos del razonamiento profesional, enseñados de manera explícita (Long, 2008; Neistadt, 1998), incluso antes de tener experiencia en la práctica real. El formato curricular del plan de estudios parece influir de manera directa en el uso de diferentes modalidades de procesamiento (Liu et al., 2000), con una gran influencia de la práctica experiencial, como sugiere Schell (2018).

No obstante, cabe también señalar que, en lo que respecta a la adquisición de destrezas asociadas al razonamiento profesional, la variabilidad individual en el proceso de aprendizaje del razonamiento profesional se ve también directamente influida por los métodos empleados en la formación. De esta forma, la literatura sobre métodos educativos concretos, como el aprendizaje basado en problemas (*problem-based learning*), la experiencia directa o el visionado de las sesiones grabadas, indica que parecen influir en la adquisición de destrezas clave que mejoran el razonamiento profesional (T. Brown et al., 2017; McCannon et al., 2004; McCarron, 2000; McDermott, 2016; Sinclair, 2004; Tona, 2003; Unsworth, 2001a). En este sentido, existe un estudio realizado por Neistadt en el que ya con anterioridad proponía una serie de estrategias que facilitaba la adquisición de estas destrezas, que se puede enlazar con los métodos descritos en la literatura (Neistadt, 1996). En síntesis, los datos sugieren que las estrategias para dirigir el pensamiento, como listas de preguntas orientadas a los componentes del razonamiento, logran mejores resultados que casos clínicos sobre el papel (Neistadt et al., 1998).

En definitiva, tanto la variabilidad individual del estudiante como los métodos docentes desarrollados para el aprendizaje del razonamiento profesional constituyen elementos clave en el proceso de adquisición de las destrezas asociadas al razonamiento profesional del estudiante de terapia ocupacional.

### 1.2.3. La evolución del proceso de aprendizaje

La evidencia sugiere que la adquisición de destrezas de razonamiento en los estudiantes no es lineal (Long, 2008). Es decir, existe un desarrollo progresivo en la adquisición de las destrezas necesarias para realizar una práctica competente o experta, pero no existe una jerarquía subyacente. Esta idea puede corroborar parte de las ideas de Creighton et al. (1995), que observan una organización secuencial de varios “archivos” conectados entre sí de acuerdo a una progresión natural en el conocimiento del terapeuta. Esta progresión se modifica en base a estrategias de ensayo-error, que permite desarrollar intervenciones o graduar la actividad. De nuevo, esto vuelve a implicar que el proceso de aprendizaje del razonamiento profesional escalonado a lo largo de los años de formación del estudiante no ocurre de manera aislada y se

asocia con el desarrollo de las diferentes competencias y destrezas profesionales (Sinclair, 2004).

Considerando de forma global los hallazgos de investigación resumidos en los párrafos anteriores de este epígrafe, es posible confirmar la existencia de lagunas en la investigación respecto al proceso de aprendizaje del razonamiento profesional de los estudiantes de terapia ocupacional, que siguen generalizándose sin tener una base firme.

Si se determinara una estructura de procesamiento de información universal, como la propuesta de Roberts (1996), sería posible estudiar los *gaps* del estudiante en la evolución de su proceso de aprendizaje del razonamiento profesional. De esta forma, seríamos capaces de abordar las lagunas en su formación y entrenar su razonamiento de la manera más eficiente para facilitar su adquisición.

No obstante, si consideramos la influencia de las variables derivadas de las características personales (Sinclair, 2004, 2007), la evolución del proceso de aprendizaje de las destrezas y competencias (Dreyfus & Dreyfus, 1980; Schmidt & Boshuizen, 1993; Seif et al., 2014; Slater & Cohn, 1991) y la influencia de la metodología docente (Neistadt, 1996, 1998; J. W. Schell, 2018), así como la interacción de todos estos elementos, estaríamos en condiciones de identificar y determinar las lagunas en la formación y diseño de los planes de estudio. En consecuencia, podríamos mejorar la educación del estudiante, para que adquiriera la mayor pericia profesional en su formación.

En relación con estos aspectos clave relacionados con la adquisición de las competencias y destrezas asociadas al razonamiento profesional del estudiante de terapia ocupacional, planteamos en el epígrafe siguiente los desafíos que ha tratado de afrontar esta investigación.

### 1.3. Desafíos del estudio

Como hemos descrito detalladamente, no existe un claro campo delimitado sobre qué es el razonamiento profesional, qué métodos son los más adecuados para favorecer su adquisición por parte de los estudiantes y cuál es el papel de la variabilidad personal en el proceso de adquisición. Por tanto, en primer lugar, es necesaria una aproximación sistemática, rigurosa y exhaustiva al objeto de estudio.

Por este motivo, se ha desarrollado una investigación centrada en una revisión exhaustiva y sistemática de la literatura existente sobre razonamiento profesional en terapia

ocupacional, con el objetivo de identificar la naturaleza y características de la investigación actual sobre el objeto de estudio.

En segundo lugar, centrándolo en concreto en el ámbito educativo o docente, una de las tesis principales de Sinclair (2004) es que existen variables que pueden afectar a la estructura y parte del contenido del razonamiento profesional. Las diferentes variables culturales y personales del estudiante o del docente pueden influenciar la diferente información que se articula durante el razonamiento. Así, el proceso subjetivo de co-construcción del razonamiento parece crear estructuras diferentes en función del estudiante. La importancia de su visión personal, su comprensión de este proceso y sobre el producto final pueden determinar el alcance sobre el que influye su subjetividad en la propia cimentación del razonamiento profesional y a su vez en relación con la totalidad del proceso de terapia ocupacional.

En consecuencia, es preciso ahondar en el concepto de la variabilidad individual y su posible inferencia sobre el proceso de adquisición del razonamiento profesional a lo largo de la formación académica.

En tercer lugar, en conjunto las dos propuestas previas permiten determinar con mayor especificidad la evolución del pensamiento de los estudiantes durante la carrera de terapia ocupacional. La adquisición de destrezas vinculadas a la práctica clínica, a la toma de decisiones, a la resolución de problemas y a la obtención de resultados son objetivos del plan de estudios y producto de un buen razonamiento profesional.

Analizar el razonamiento de los estudiantes permite encontrar las limitaciones en la formación y establecer puntos de mejora constante en los programas y asignaturas. Estos resultados se podrán vincular con la efectividad en la práctica, favoreciendo herramientas formativas, mejorando los estándares de calidad e incluso aumentando nuestro conocimiento de conceptos vinculados directamente con este campo, como los conceptos de razonamiento diagnóstico, la elección de abordajes específicos o la interpretación de la narrativa y características del cliente.

Por tanto, el objetivo principal con el que se plantea esta tesis es identificar y describir los mecanismos básicos que regulan la eficacia y eficiencia del razonamiento profesional durante la formación académica del estudiante en terapia ocupacional.

Para lograr este objetivo es necesario realizar una aproximación al razonamiento profesional, de manera global, para identificar las posibles lagunas de conocimiento y, específicamente, las relacionadas con el aprendizaje del razonamiento durante la formación

académica. La fundamentación teórica de este campo radica en la esencia misma de la ocupación como medio terapéutico, paradigma de la disciplina de la terapia ocupacional.

Con estos propósitos, en primer lugar, se plantea la identificación de la naturaleza y volumen de la literatura relativa al razonamiento profesional en terapeutas ocupacionales. Hasta la fecha no ha habido una revisión exhaustiva que permita definir y categorizar la evidencia científica existente. El único intento de revisión de la literatura relativa a este campo (Unsworth & Baker, 2016) describió que la diversidad de métodos empleados a lo largo de los años dificultaba la evaluación de la calidad. Maruyama et al. (2021) atribuyen la falta de definición de este campo a la amplitud de marco teórico que supuso el cambio de término “razonamiento clínico” a “razonamiento profesional”, creando incerteza en su uso, más aún en sus implicaciones. Este conflicto para el análisis aumenta la falta de consenso en el estudio, y retroalimenta la definición del propio campo.

Esta revisión de la literatura sobre la materia permite identificar diversas lagunas de investigación. Gracias a la definición del volumen de la literatura, es posible extrapolar la relativa a los estudiantes y la adquisición de pericia durante el proceso formativo. Todavía no existe un consenso en los factores que determinan la eficacia y eficiencia del razonamiento de los estudiantes, ni cómo adquieren estos los diferentes componentes o competencias necesarias para llegar a un razonamiento elaborado que permita una intervención de calidad.

Como exponía en su tesis Sinclair (2004), existen variables individuales y culturales que modifican la estructura y contenido del razonamiento profesional en los estudiantes. Ejemplo de estos factores pueden ser los métodos de aprendizaje empleados por el docente o la propia cultura en la que se enmarca el alumnado. Si observamos este detalle, surge un paralelismo con algunas teorías específicas dentro de la propia terapia ocupacional, reflejadas en el Marco de Trabajo de la Asociación Americana de la Terapia Ocupacional (AOTA) («Occupational Therapy Practice Framework», 2020). Como tal, los factores personales que modifican los patrones de desempeño o forma ocupacional de sus ocupaciones diarias (Kielhofner & De las Heras, 2006), reflejan aspectos como edad, género, raza, cultura o estilos de vida.

Si las características personales y culturales del estudiante pueden modificar la estructura y contenido de su razonamiento profesional, la co-construcción de este debe estar influenciada por un número todavía impreciso de posibles variables relativas a estas características. Esta afirmación se ve determinada por la falta de consenso en el campo y la multitud de modelos que tratan de establecer diferentes perspectivas sobre las influencias del razonamiento. Por tanto, para profundizar todavía más en esta causalidad personal, es necesario realizar un abordaje con una metodología categórica, pero con cualidades vinculadas a la

investigación fenomenológica, para tratar de mantener al máximo la individualidad de los resultados.

La evidencia vinculada a estos resultados puede ayudar a establecer un modelo de aprendizaje que permita optimizar al máximo la influencia de las características individuales, así como a desarrollar métodos fundamentados en la población de estudiantes, que garanticen resultados representativos.

Como último punto, definidos los posibles perfiles o categorías de variabilidad que influyen en el razonamiento, es posible determinar la evolución de este a lo largo de los años de estudios. Los modos en que los novatos organizan en la evaluación inicial su conocimiento para analizar y sintetizar la información recogida son elementos de importancia prioritaria para adquirir un razonamiento profesional apropiado en su educación académica. Aunque esta línea de investigación ha sido extensa a lo largo de los años, sigue habiendo lagunas en la evidencia empírica, con más relevancia de los aspectos de procesamiento de la información y las variables personales en el razonamiento.

El diagnóstico ocupacional se establece como foco de esta parte al considerarse el producto del proceso de recogida de información y resolución de problemas en la evaluación ocupacional. En este aspecto, la evidencia carece de conocimiento específico relacionado con la representación del problema.

Para abordar esta cuestión, se articula una investigación desde una perspectiva de diferentes centros educativos. Al tener en cuenta la propuesta de las influencias personales y culturales en la co-construcción, se sugiere un abordaje preferentemente multicultural para la metodología de estudio. Este enfoque considera suficientes variables como para poder establecer un mecanismo común subyacente que permita la generalización del conocimiento. Con un número de variables suficientes para establecer un método análisis del razonamiento de los estudiantes, es posible detallar sus limitaciones en la formación y las características de la evolución de su razonamiento profesional durante los años.

Considerando de manera global los argumentos planteados en la justificación de este estudio, en el epígrafe siguiente planteamos los objetivos de la investigación.



## 2. Objetivos

### 2.1. Objetivo general

- Identificar y describir los mecanismos básicos que regulan la eficacia y eficiencia del razonamiento profesional del estudiante de terapia ocupacional.

### 2.2. Objetivos específicos

- Identificar y describir el volumen, naturaleza y características de la investigación sobre razonamiento profesional en terapia ocupacional.
- Describir la evidencia científica sobre el razonamiento profesional en terapia ocupacional existente hasta la actualidad.
- Identificar la investigación llevada a cabo sobre la adquisición del razonamiento en estudiantes de terapia ocupacional.
- Identificar el rango de perspectivas en la población de estudiantes de terapia ocupacional con relación a la terminología o conceptos que son claves para mejorar su razonamiento profesional.
- Analizar la habilidad de los estudiantes para identificar y categorizar información durante la recogida de información.
- Estudiar la habilidad para analizar y sintetizar la información en la formulación del diagnóstico ocupacional.
- Analizar los cambios en el razonamiento profesional de los estudiantes durante la formación académica.



## 3. Fases de la investigación

### 3.1. Fase 1: Scoping review de la literatura

El concepto de razonamiento profesional es un eje central en la argumentación sobre la práctica en la disciplina. Sin embargo, a pesar de esta importancia, el cuerpo de conocimiento sobre el mismo todavía es inadecuado (Hooper, 1997, 2017; Schaaf, 2015). Hasta la fecha, no ha habido ninguna revisión de la literatura científica en profundidad que permitiera definir y resumir la evidencia científica existente en el área del razonamiento profesional desde terapia ocupacional. Aunque se han llevado a cabo revisiones previas (Matthews et al., 2017; Turner & Alsop, 2015; Unsworth & Baker, 2016), aspectos como la limitación en la selección de bases de datos, el idioma de los estudios y la dificultad para análisis generalizados pueden ser posibles sesgos que podrían haber afectado a la información recogida.

Por esta razón, se planteó una revisión de la literatura, siguiendo un diseño de scoping review (Arksey & O'Malley, 2005; Levac et al., 2010) para identificar y describir las publicaciones científicas sobre razonamiento profesional y para analizar el desarrollo histórico de esta área de investigación desde 1982 a 2017, así como la naturaleza del volumen de la literatura científica sobre razonamiento profesional en terapia ocupacional y la evidencia que existe hoy en día.

Durante el método de recogida de datos y de procesamiento de los mismos, se puso especial énfasis en categorizar la información de acuerdo a las sugerencias de la evidencia sobre el ámbito educativo o de aprendizaje del razonamiento profesional. De esta manera, las principales conclusiones permitieron extrapolar los resultados al ámbito educativo. Aquí fue donde cobraron relevancia dos aspectos fundamentales. Por un lado, la subjetividad del aprendizaje, de sus componentes y de la individualidad del proceso, representado por una predominancia de metodología cualitativa en los estudios. Por otro lado, la dificultad de encontrar un método de estudio estandarizado y de generalizar los datos a la mayor parte del colectivo.

En la evidencia no se encontró descrito ningún método accesible para examinar la profundidad del razonamiento profesional de estudiantes de terapia ocupacional, aunque sí algunos de sus componentes. Existen herramientas como el *California Critical Thinking Skills Test* o el *Self-Assessment of Clinical Reflection and Reasoning* (Coker, 2009, 2010; Scaffa & Wooster, 2004; Velde et al., 2006), que evalúan una pequeña parte de la complejidad del razonamiento. La tendencia en otras disciplinas extrapolan procedimientos cuantitativos que

permiten generalizar aspectos de neuroimagen, causalidad personal o concordancia entre guiones internos con la práctica (Arocha & Patel, 2019).

Existe una necesidad de aplicar y desarrollar métodos específicos de análisis en terapia ocupacional, sobre todo en los aspectos del proceso de evaluación e intervención. La aplicación de estos métodos contribuye no sólo al desarrollo del conocimiento sobre razonamiento profesional, sino al desarrollo de la disciplina.

### 3.2. Fase 2: Exploración las características personales de los estudiantes

El desarrollo de un razonamiento profesional efectivo ha sido el objetivo primario de los estudios de terapia ocupacional durante muchos años (Hocking & Ness, 2002; Scanlan & Hancock, 2010; World Federation of Occupational Therapists, 2016). De hecho, las prácticas clínicas proveen de oportunidades para refinar estas habilidades (Coates & Crist, 2004; Scanlan & Hancock, 2010; Sladyk & Sheckley, 2001).

Gracias al estudio desarrollado en la fase 1, se observó que una de las áreas de investigación de la literatura en razonamiento profesional a lo largo de los años fueron aquellos aspectos relativos a los estudiantes, con un 20% de las publicaciones totales (Márquez-Álvarez et al., 2019). La pionera en demostrar la importancia de este tema de estudio fue Neistadt (1992), quién desarrolló diferentes enfoques y herramientas pedagógicas que permiten mejorar la adquisición de las habilidades necesarias para construir pericia sobre el dominio profesional (Neistadt, 1987, 1992, 1996, 1998; Neistadt et al., 1998).

Aunque el razonamiento profesional no es un concepto novedoso, los docentes y educadores tienden a focalizar su aprendizaje sobre cómo pensar como un profesional de acuerdo con una terminología específica y el uso de estrategias que mejoran la toma de decisiones a través de la reflexión. La claridad en relación a su naturaleza y a su comprensión en sus usos provee una base firme para el desarrollo de estrategias de aprendizaje que apoyen la adquisición de esta habilidad en estudiantes sanitarios (Patton & Christensen, 2019). De acuerdo con Blumberg (2009), los educadores necesitan planificar cómo los estudiantes practicarán su compromiso con los contenidos que requieren estos diferentes tipos de conocimiento y no asumir que aprenderán los conocimientos conceptuales o procedurales atendiendo clases expositivas o demostraciones. Y para ello, es necesario pedir a los estudiantes que reflexionen sobre su propio proceso de aprendizaje y que evalúen su progreso de aprendizaje. Las habilidades de razonamiento profesional difieren significativamente entre la experiencia de los profesionales y de los estudiantes (Dutton, 1995).

“Cuanta mejor sea la comprensión de la práctica experta y cómo razonan los expertos, mejor será nuestra capacidad para proveer este conocimiento complejo y frecuentemente tácito a los novatos para acelerar el progreso en su camino a la pericia.” (Unsworth & Baker, 2016, p. 14)

La importancia del razonamiento profesional en programas de educación superior como medio para el desarrollo de hábitos profesionales, habilidades y pensamiento ha ganado importancia durante los años como necesidad del aprendizaje para enfatizar la reflexión en el pensamiento más que para sólo equipar a los educadores con procesos de seguimiento o toma de decisiones (Pitonyak et al., 2020). La manera en que los novatos organizan su conocimiento para analizar y sintetizar la información recogida durante la evaluación inicial es un elemento de primera importancia para adquirir un razonamiento profesional adecuado durante su educación académica.

Para analizar este razonamiento, existen diferentes herramientas y teorías, que recogen procesos analíticos y no-analíticos que interactúan y trabajan de manera conjunta. El estudio de estos procesos por separados normalmente conduce a una sobre simplificación de las conclusiones obtenidas, así que en lugar de intentar centrarse en aspectos específicos o en atributos como la resolución de problemas o la toma de decisiones, las herramientas de evaluación del aprendizaje más modernas buscan el desarrollo de evaluaciones que apoyen la complejidad del proceso (Schuwirth et al., 2018).

En este sentido, la Metodología-Q, *Q-method* o *Q-methodology*, es uno de los posibles ejemplos que permiten identificar y evaluar de manera potencial el conocimiento del estudiante sobre su razonamiento profesional, y que se enlaza con la medición de resultados del aprendizaje.

Q-method es una herramienta que permite una mejor comprensión de la perspectiva de las personas y sus creencias, que son generados y explorados a través de unos métodos específicos de recogida de datos y análisis estadístico (S. R. Brown, 1993, 1996, 2008). Incorpora técnicas cuantitativas y cualitativas para examinar la subjetividad humana, cuyo trato complementario provee de objetividad en los datos más relevantes gracias a un proceso estadístico riguroso (Garbellini et al., 2020; Watts & Stenner, 2012). En la evidencia, se ha aplicado a la mejora de los programas educativos de educación superior y a políticas sanitarias y de calidad con buenos resultados (Alderson et al., 2018; Tiernon et al., 2017).

El objetivo de este estudio fue identificar el rango de perspectivas en la población de estudiantes de terapia ocupacional con relación a la terminología o conceptos que son claves para mejorar su razonamiento profesional.

Gracias a esta metodología, aplicada por primera vez en el estudio del razonamiento profesional, se permitió categorizar a los estudiantes en cuatro grupos de perfiles. El análisis mediante esta metodología parte de un método de análisis estadístico específico llamado análisis de factores (*factor analysis*). Este análisis es capaz de reducir un gran número de variables en un número de factores mucho más pequeño de factores para agrupar a las personas de acuerdo con cómo interpretan diferentes conceptos o afirmaciones sobre un mismo tema. La variabilidad personal de cada perfil se mantiene en términos de rangos extremos, donde reside el foco del análisis, al ser categorías definitorias de esos rasgos personales.

Los resultados dividieron a los estudiantes en cuatro perfiles diferentes con representatividad estadística. La variabilidad de estos perfiles pareció basarse en los aspectos del razonamiento profesional, discutidos ampliamente en la literatura. Existe una alta correspondencia entre los aspectos narrativo, interactivo y condicional en relación con la gran mayoría de los componentes del análisis, cuyas diferencias parecieron centrarse en mayor medida en la relación con el cliente.

### 3.3. Fase 3: Aprendizaje y desarrollo del razonamiento diagnóstico en estudiantes

Potenciado por los estudios de razonamiento diagnóstico realizados en medicina desde la década de 1980, los estudios del razonamiento profesional en terapia ocupacional han llevado a diferentes líneas de investigación en un ámbito similar (Unsworth, 2001b). Una de las líneas más importantes de estudio del proceso de información implica el razonamiento diagnóstico entendido como un proceso de resolución de problemas o de toma de decisiones (Cohn, 1991; Fleming, 1991a; Harries et al., 2012; Rassafiani et al., 2009; Rogers & Holm, 1991; B. A. B. Schell & Cervero, 1993). Esta área de investigación provee modos de observación de las diferentes competencias que precisan los terapeutas ocupacionales para gestionar la información y llegar a un diagnóstico ocupacional, en diferentes aspectos de la práctica clínica (Doyle et al., 2014; Faller et al., 2016; Kristensen et al., 2012; Kuipers & Grice, 2009; L. Robertson, 1996a).

El razonamiento diagnóstico examina y analiza la causa o naturaleza de las condiciones que requieren terapia ocupacional e intenta dar una explicación sobre la causa de que el cliente experimente estos problemas empleando una mezcla de información basada en la evidencia científica y el perfil del cliente (B. A. B. Schell, 2009). Cuando el razonamiento diagnóstico no

está bien construido, las causas de los déficit del desempeño pueden malinterpretarse o no ser correctamente identificadas, derivando en la aplicación errónea de los principios que rigen la intervención y realizando una terapia inefectiva (B. A. B. Schell & Schell, 2017).

En el caso de los estudiantes universitarios, la información suele ser menos definida que en expertos, debido en gran parte a la falta de conocimiento específico relacionado con la representación del problema (D. Robertson et al., 2015; L. Robertson, 1996b). Subsecuentemente, la manera en que los novatos organizan su conocimiento para analizar y sintetizar la información recogida durante la evaluación inicial es un elemento prioritario para adquirir un razonamiento profesional apropiado durante su educación académica.

En terapia ocupacional, la línea de investigación que se enfoca en el estudio de la diferencia entre novatos y expertos ha sido extensa (Chapparo & Ranka, 2008; Unsworth, 2001b; Unsworth & Baker, 2016). Sin embargo, existen vacíos en la evidencia de importancia para arrojar luz sobre el procesamiento de información, la supervisión de las prácticas clínicas y las variables de causalidad personal en el razonamiento (B. A. B. Schell et al., 2008). En concreto, aquel relacionado con el aprendizaje y desarrollo del razonamiento diagnóstico en estudiantes de terapia ocupacional.

El objetivo de este estudio ha sido analizar la habilidad de los estudiantes para identificar y categorizar información durante la recogida de datos, su habilidad para analizar y sintetizar información durante la formulación del problema, y los cambios realizados durante la educación de estos.

El estudio pone en relevancia las dificultades del estudiantado para organizar su habilidad de análisis y síntesis en la formulación del problema. Pese al aumento de conocimiento durante los años de carrera, estas limitaciones parecen mantenerse durante los años que dura la formación. Esta organización poco adecuada debe establecerse como punto de mejora en los programas educativos, ya que el proceso subyacente puede ser clave en el aprendizaje del proceso de razonamiento diagnóstico.





## 4. Abstracts

### 4.1. Professional Reasoning in Occupational Therapy: A Scoping Review

#### Introducción/Objetivo:

El razonamiento profesional en terapia ocupacional es el proceso empleado por los profesionales para planificar, dirigir, llevar a cabo y reflexionar sobre los cuidados del cliente. La habilidad profesional para gestionar el proceso de intervención se estructura a su alrededor, influenciando a su vez la efectividad del trabajo llevado a cabo. Los objetivos de esta investigación fueron identificar y describir (a) el desarrollo histórico de esta área de investigación desde 1982 a 2017 y (b) la naturaleza y volumen de la literatura científica del razonamiento profesional en terapia ocupacional y la evidencia que existe actualmente.

#### Método:

Se llevó a cabo un scoping review para realizar un mapeo histórico de la investigación en razonamiento profesional y para resumir las líneas de investigación de los datos explorados. La revisión se llevó a cabo en cinco etapas de acuerdo con la metodología PRISMA. Después de aplicar los criterios de selección, se identificaron 303 estudios.

#### Resultados:

Los resultados se presentan bajo tres encabezados: (a) naturaleza y volumen de publicaciones del razonamiento profesional en terapia ocupacional de acuerdo con el número y año de publicación, revista, país, autor y línea de investigación; (b) tendencias históricas en la literatura científica en el razonamiento profesional en terapia ocupacional desde 1982; y (c) aspectos metodológicos de la investigación. Cada uno de ellos se discute a través de un análisis estadístico.

#### Conclusiones:

La investigación sobre razonamiento profesional en terapia ocupacional es un campo de naturaleza empírica en el que predominan los estudios cualitativos. Las líneas de investigación principales se centran en campos de práctica específicos, estudiantes y aspectos teóricos del razonamiento profesional. Se identificaron tres fases históricas con aspectos en común en términos de objetivos y métodos de investigación.

## 4.2. A Q-method approach to perceptions of professional reasoning in occupational therapy undergraduates

### Introducción/Objetivo:

El Desarrollo de un razonamiento profesional efectivo ha sido el objetivo primario de los estudios de terapia ocupacional durante muchos años, y las prácticas clínicas proveen la oportunidad para refinar estas habilidades. El razonamiento profesional provee una base firme para el desarrollo del aprendizaje, y estrategias de evaluación que apoyen la adquisición de habilidades en estudiantes de ciencias de la salud. Sin embargo, los educadores en terapia ocupacional deberían usar diversos métodos de evaluar el aprendizaje para examinar los resultados de aprendizaje de los estudiantes de manera plena. La tendencia para estudiar la perspectiva individual del razonamiento profesional ha ganado terreno durante los años. El propósito de este artículo es identificar el rango de perspectivas de los estudiantes de terapia ocupacional acerca de los términos o conceptos que son clave para mejorar su razonamiento profesional.

### Método:

Se empleó Metodología-Q (Q-methodology) para profundizar en el objeto de estudio. Este enfoque facilita una mejor comprensión de las creencias y perspectivas de las personas, que se generan y exploran a través de un método específico de recogida de datos y análisis estadístico. Se generó un conjunto de conocimiento relativo a ideas, frases, terminología y conceptos asociados con varios estudios del razonamiento profesional en terapia ocupacional, específicamente sobre estudiantes en este campo. Se escogieron los términos que tuvieron una evidencia más clara, más relevante o el mayor número de citas en la literatura (n=37).

### Resultados:

A través del análisis estadístico de los Q-sort de 37 estudiantes de terapia ocupacional, 8 factores por defecto fueron creados, centrados en 4 puntos de vista de acuerdo con los criterios de selección. Se discutió e interpretó cada punto de vista.

### Conclusiones:

Las percepciones observadas fueron enlazadas con varios aspectos del razonamiento profesional que han sido discutidos ampliamente en la literatura de terapia ocupacional. Para la mayoría de los estudiantes, hubo una fuerte correspondencia entre los aspectos narrativo, interactivo y condicional en varios de los componentes.

### 4.3. Learning and Development of Diagnostic Reasoning in Occupational Therapy Undergraduate Students

#### Introducción/Objetivo:

Una manera de facilitar a los estudiantes de terapia ocupacional la transferencia de las habilidades académicas de recogida de datos y análisis de los aspectos profesionales es asegurar su uso de razonamiento diagnóstico de manera competente. Sin embargo, existen vacíos importantes y obvios en la evidencia empírica relacionada con el aprendizaje y desarrollo de esta modalidad de razonamiento en los estudiantes de terapia ocupacional. Los más importantes se relacionan con la promoción del pensamiento superior y el uso de información para resolver problemas en el contexto de la práctica profesional. Este estudio analiza el razonamiento diagnóstico y sus cambios durante su educación.

#### Método:

Este estudio multicentro fue desarrollado con un diseño observacional descriptivo. El estudio se llevó a cabo en la Universidad de Coruña (España), la Universidad de Castilla-La Mancha (España) y la Universidad de El Valle (Colombia). La muestra fue n=247. Para la recogida de datos, se diseñó un caso clínico de manera específica. Para el análisis de datos se emplearon el IBM SPSS Statistics (v19) y el EPIDAT 3.1.

#### Resultados:

Los participantes identificaron y categorizaron los problemas de desempeño ocupacional. Sin embargo, tuvieron dificultades al identificar y categorizar los componentes del desempeño ocupacional (específicamente, los síntomas y signos de la enfermedad presentes en el estudio de caso). Mostraron limitaciones para analizar y sintetizar la información recogida para desarrollar una explicación de los problemas ocupacionales y sus causas.

#### Conclusiones:

La habilidad de los estudiantes para analizar y sintetizar la información durante la recogida de datos está pobremente organizada, lo que dificulta la formulación del problema. Este estudio contribuye al conocimiento de los aspectos relativos al razonamiento diagnóstico de los estudiantes, específicamente a las capacidades y límites del procesamiento de información de los estudiantes durante el proceso de evaluación.



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## 5. Manuscritos



## 5.1. Professional Reasoning in Occupational Therapy: A Scoping Review

## Review Article

**Professional Reasoning in Occupational Therapy: A Scoping Review**

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*Background/Aim.* Professional reasoning in occupational therapy is the process used by practitioners to plan, direct, perform, and reflect on client care. The professional's ability to manage the process of the intervention is structured around it, thereby influencing the effectiveness of the work carried out. The objectives of this research were to identify and describe (a) the historical development of this area of research from 1982 to 2017 and (b) the nature and volume of the scientific literature on professional reasoning in occupational therapy and the evidence that exists today. *Methods.* A scoping review method was used to carry out an historical mapping of research on professional reasoning and to summarise the lines of research explored to date. The review was conducted in five stages following the PRISMA guidelines. After applying the selection criteria, the search identified 303 references. *Results.* The results are presented under three headings: (a) nature and volume of publications on professional reasoning in occupational therapy according to number and year of publications, journal, country, author, and line of research; (b) historical trends in the scientific literature on professional reasoning in occupational therapy since 1982; and (c) methodological aspects of the research. Each of them is discussed through statistical analysis. *Conclusions.* The research about professional reasoning in occupational therapy is a field of empirical nature, in which qualitative studies predominate. Principal lines of research are focused on specific fields of practice, undergraduates, and theoretical aspects of professional reasoning. There were identified three historical phases with common features in terms of objectives and research methods.

**1. Introduction**

In occupational therapy, professional reasoning can be defined as the process used by practitioners to plan, direct, perform, and reflect on client care [1, 2]. Its importance in professional practice is fundamental given that the professional's ability to manage the process of assessing, planning, and implementing the intervention is structured around it, thereby influencing the effectiveness of the work carried out [2–4].

Currently, the scientific literature on professional reasoning in occupational therapy describes it as a highly complex mode of thought that “involves all the thinking processes of the clinician as s/he moves into, through and out of the therapeutic relationship and therapy process with a client” [4]. It is characterised as a mode of tacit, highly creative and deeply phenomenological thinking [5, 6], aimed at determining the focus of care for a given client or group of clients [1]. It is studied using a range of approaches, in terms of both focus and method [7].

TABLE 1: List of descriptors and keywords used in the search.

MeSH	DeCS	Keywords
Occupational therapy	Terapia Ocupacional	Reasoning
Allied health occupations	Empleos Relacionados con Salud	Allied health personnel
Problem solving	Solución de Problemas	Clinical reasoning
Patient care planning	Planificación de Atención al Paciente	Professional reasoning
Decision-making	Toma de Decisiones	
Cognition	Cognición	

Despite its importance in our discipline, the body of knowledge on professional reasoning in occupational therapy is still inadequate [8, 9]. To date, there has been no full, comprehensive review of the scientific literature that would allow us to define and summarise existing scientific evidence in the area of professional reasoning in occupational therapy. Previous reviews of the literature on clinical reasoning in occupational therapy limited the databases selected, the languages of the studies, and the analyses carried out. They were therefore subject to possible biases in the information gathered. [4, 10, 11].

For this reason, we conducted a scoping review to identify and describe the scientific publications on professional reasoning and to analyse the historical development of this area of research from 1982 to 2017 and the nature and volume of the scientific literature on professional reasoning in occupational therapy and the evidence that exists today.

## 2. Materials and Methods

A scoping review method [12–14] was used to carry out an exploratory historical mapping of research on professional reasoning and to summarise the lines of research explored to date. The review was conducted in five stages [14] following the PRISMA guidelines [15].

*2.1. Review Question and Relevant Papers.* The research questions that guided the review were as follows: (a) What is the nature and volume of the literature on professional reasoning in occupational therapy? (b) How has research on professional reasoning evolved over time? In the first stage, a two-step search strategy was employed for this review. First, an initial search strategy (January 11, 2018) was created for Medline (using Ovid) and was adapted to each search: (1) reasoning.af (16,579); (2) occupational therapy/(12,440); (3) occupational therap\*.ab,ti (10,234); (4) allied health occupations/(547); (5) allied health personnel/(11,272); (6) 2 or 3 or 4 or 5 (27,348); (7) 6 and 1 (218). In this way, we established if the terms contained in the title, abstract, or keywords of the retrieved citations allied with the planned search terms. Finally, the keywords used are classified in Table 1.

Second, the formal literature search was conducted across the selected databases: OTDBase, CINAHL, Medline, WOS, Embase, Scopus, ISOC, Latindex, LILACS, LivRe, ProQuest, CSIC (Spanish National Research Council), and Dialnet.

The results were actualized on February 15, 2019. In addition to the abovementioned databases, a search was also carried out on Google Scholar (<https://scholar.google.es/>) and the catalogue of the Network of Spanish University Libraries (<http://rebiun.org/>) in order to identify further references from magazines, books, book chapters, and theses for their possible inclusion. With this search strategy, we have tried to gather information in the most thorough way possible, without limiting the language of the documents and by incorporating databases that have not been used in previous literature reviews. Our aim was to avoid any bias that could diminish the information obtained.

*2.2. Selection of Relevant Studies.* In the second stage, we proceeded to identify and select the relevant studies. The following selection criteria were established.

- (i) Inclusion criteria: any article, book (publications dealing with professional reasoning in all their chapters), book chapter (publications that, while appearing in a book on various subjects, specifically cover the subject in question), or doctoral thesis in which any of the keywords appear in the title, keywords list, abstract, or headings of the document. Material in any language was included
- (ii) Exclusion criteria: documents that did not contain any of the keywords were excluded. Furthermore, after removing any duplicate documents, we excluded studies that did not focus on professional reasoning in occupational therapy or in health professions that would include occupational therapists

These inclusion and exclusion criteria were refined as we gained familiarity with the literature [12].

*2.3. Data Charting.* In the third stage, carried out simultaneously with stage two, the data were extracted from each 303 references and included in a data extraction table developed by the research team. This data extraction table was developed using the programme IBM SPSS Statistics (V.25). The data extraction process was carried out by researchers L.M. and M.T. independently. It was subsequently reviewed by researchers C.A. and P.M.

*2.4. Data Sorting and Analysis.* The fourth stage consisted of sorting the data following an iterative process and using



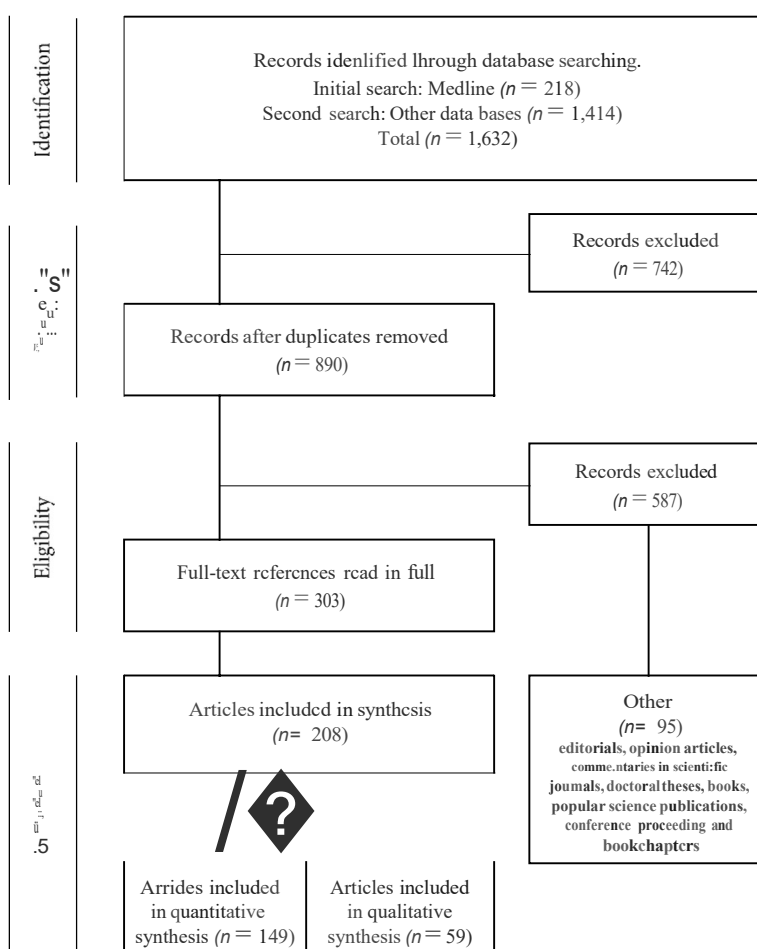


FIGURE 1: PRISMA flow diagram [15].

the following categories: title, author, characteristics of the publication (journal or publisher, year of publication, publication type, and language), objectives of the study, and study design (type of method, type of study, methodological design of the study, and subject of the study). Our aim was to identify parameters for analysing the literature that would enable us to carry out a detailed critical review. The fifth stage involved a comprehensive review of the selected documents. After reading and analysing the articles published in indexed journal, the historical research trends since the publication of the first article in 1982 were identified [16]. Lastly, a descriptive and inferential statistical analysis was performed by applying the chi-square test to the different categories of scientific articles published between 1982 and 2014. In addition, Fisher's exact test was applied to scientific articles included in the same period with a frequency below  $n = 5$  to analyse the statistically significant relationships between the variables selected in cases where the chi-square test was not representative. To carry out the statistical analyses detailed above, the articles were grouped into 10-year periods in order to compare the different phases statistically. Therefore, articles published between 2015 and 2017 were not considered in these statistical analyses.

### 3. Results

The search strategies retrieved 1,632 references (890 once duplicates were removed). After applying the selection criteria, we identified 303 references (Figure 1).

The results are presented under three headings: (a) nature and volume of publications on professional reasoning in occupational therapy according to number of publications, year of publication, journals, country, author, and line of research; (b) historical trends in the scientific literature on professional reasoning in occupational therapy since 1982; and (c) methodological aspects of the research.

**3.1. Nature and Volume of Publication.** Of the 303 references analysed, the largest percentage corresponds to articles published in indexed journals (original studies and reviews):  $n = 208$  (68.6%). The remaining references are editorials, opinion articles, and commentaries in scientific journals, with  $n = 37$  (12.2%); doctoral theses,  $n = 22$  (7.3%); books,  $n = 7$  (2.3%); popular science publications,  $n = 5$  (1.7%); conference proceedings,  $n = 12$  (4%); and book chapters,  $n = 12$  (4%). With regard to the languages used by the authors, English predominates with  $n = 280$  (92.4%), followed by Spanish,  $n = 14$  (4.6%); German,  $n = 5$

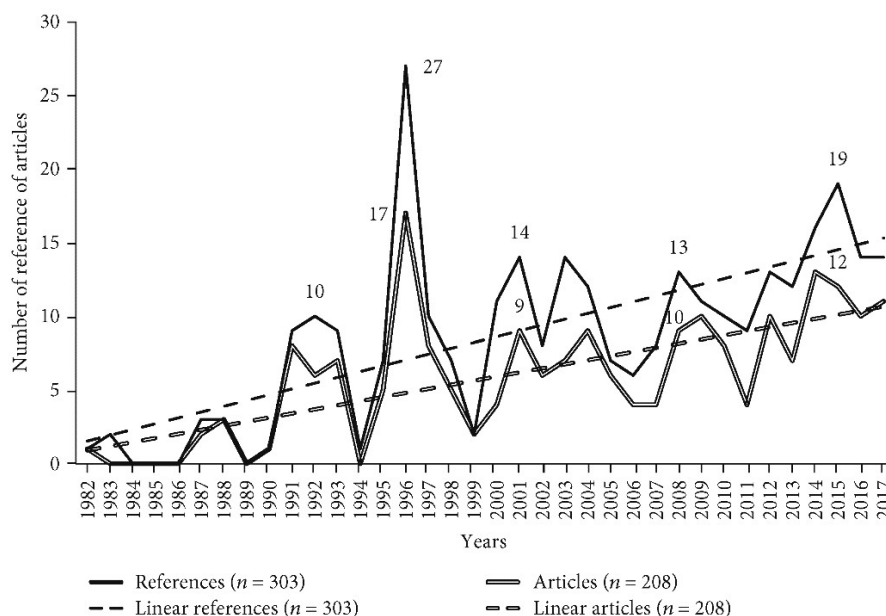


FIGURE 2: Comparison between number of documents published and articles published in indexed journals (original studies and reviews) 1982-2017.

(1.7%); and French, Polish, Portuguese, and Hebrew,  $n = 1$  (0.3%).

Since 1982, a gradual and steady increase can be observed in the number of documents published (Figure 2).

The analysis reveals that the articles published in indexed journals (original studies and reviews) were published in 49 different journals, with publications in English predominating ( $n = 195$ ; 93.8%). The journals with the largest number of articles are *the American Journal of Occupational Therapy*, with  $n = 42$  (20.2%), and *the British Journal of Occupational Therapy*, with  $n = 32$  (15.4%). These are followed by *the Australian Journal of Occupational Therapy*, with  $n = 18$  (8.7%); *Occupational Therapy in Health Care*, with  $n = 17$  (8.2%); the *Scandinavian Journal of Occupational Therapy*, with  $n = 15$  (7.2%); and the *Canadian Journal of Occupational Therapy*, with  $n = 10$  (4.8%). The rest of the journals fell short of 10 articles published. With regard to non-English-language journals, the greatest number of publications was found in the Spanish-language TOG (A Coruña), with  $n = 4$  (1.9%).

With regard to the 439 authors, English-speaking authors overshadow the rest with  $n = 414$  (94.3%). No author, except for C.A. Unsworth, with nine empirical articles and one non-empirical article, reaches a total of 10. This author is followed by Neistadt, with seven empirical articles, and Rodger and Ziviani, with five empirical articles. With regard to non-English-speaking authors, only two appear among the top 29: Talavera, with four empirical articles, and Moruno, with two.

In addition, four major lines of research were identified in the analysis of the articles published in indexed journal (original studies and reviews) (Table 2).

With regard to the books and book chapters published from 1982 to the present, an irregular pattern can be

observed when compared to the scientific articles published in indexed journals. Books (57.1%) and book chapters (50%) of a theoretical nature predominate. Since 1995, the year in which the first doctoral thesis on professional reasoning in occupational therapy was published, there has been a gradual increase in the publication of doctoral theses similar to the increase observed in articles published in indexed journals. With regard to the methodology of the doctoral theses, in contrast to the articles published in indexed journals, quantitative studies predominate (57.1%;  $n = 13$ ), followed by qualitative studies (38.1%;  $n = 8$ ) and mixed studies (4.8%;  $n = 1$ ). The main lines of research among the doctoral theses are student reasoning ( $n = 8$ ; 38.1%), specific professional fields ( $n = 3$ ; 13.6%), and novice/expert reasoning ( $n = 3$ ; 13.6%).

**3.2. Historical Trends.** The first article focused on the study of clinical reasoning was published in 1982 [16] and aimed to define this area of study within the field of occupational therapy. The first review of the literature on clinical reasoning in occupational therapy was published in 1993 [17].

On the basis of the analysis of the articles published in indexed journals (original studies and reviews) published between 1982 and 2017 ( $n = 208$ ), it was identified that  $n = 149$  (71.6%) are empirical studies and  $n = 59$  (28.4%) do not have an empirical basis. It should be noted that between 1982 and 1993, there are a similar number of non-empirical articles  $n = 10$  (4.8%) and empirical ones  $n = 11$  (5.3%). In that period, the articles are mainly exploratory and descriptive (Table 3).

In more recent periods, an increase can be observed in the publication of both empirical and nonempirical articles, and in the variety of methodological approaches used in the

TABLE 2: Number of articles published in indexed journal (original studies and reviews) published between 1982 and 2017 by line of research.

	1982-1992 (n=21) n (%)	1993-2003 (n = 70) n(%)	2004-2014 (n = 84) n (%)	2015-2017 (n = 33) n (%)	Total (n = 208) n(%)
Theoretical	3 (1.4)	<b>11</b> (5.3)	12 (5.8)	9 (4.3)	35 (16.8)
Student reasoning	4 (1.9)	13 (6.3)	19 (96.1)	6 (2.9)	42 (20.2)
Information processing	3 (1.4)	12 (5.8)	5 (2.4)	5 (2.4)	25 (12)
Specific professional fields					
The elderly	1 (0.5)	<b>2</b> ( <b>1</b> )	2 (1)	0 (0)	5 (2.4)
Mental health/psychosocial	2 (1)	1 (0.5)	4 (1.9)	<b>1</b> (0.5)	8 (3.8)
Schools	1 (0.5)	0 (0)	0 (0)	0 (0)	<b>1</b> (0.5)
Spinal cord injury	0 (0)	1 (0.5)	0 (0)	0 (0)	1 (0.5)
Cancer	0 (0)	1 (0.5)	<b>1</b> (0.5)	0 (0)	2 (1)
Neurology	0 (0)	1 (0.5)	6 (2.9)	<b>1</b> (0.5)	8 (3.8)
Hand damage	0 (0)	0 (0)	<b>2</b> ( <b>1</b> )	0 (0)	2 ( <b>1</b> )
Community	0 (0)	4 (1.9)	3 (1.4)	0 (0)	7 (3.4)
Support/accessibility technology	0 (0)	0 (0)	<b>1</b> (0.5)	4 (1.9)	5 (2.4)
Paediatrics	0 (0)	<b>2</b> ( <b>1</b> )	6 (2.9)	<b>2</b> ( <b>1</b> )	10 (4.8)
Physical disability	1 (0.5)	3 (1.4)	4 (1.9)	1 (0.5)	9 (4.3)
Other lines					
Novice/expert	1 (0.5)	7 (3.4)	5 (2.4)	3 (1.4)	16 (7.7)
Modalities of reasoning	5 (2.4)	7 (3.4)	6 (2.9)	0 (0)	18 (8.7)
Assistants	0 (0)	2 (1)	0 (0)	0 (0)	2 (1)
Research methodology	0 (0)	3 (1.4)	5 (2.4)	1 (0.5)	9 (4.3)
Cultural aspects and contexts	0 (0)	0 (0)	3 (1.4)	0 (0)	3 (1.4)

The percentages were calculated on the basis of the sample of articles published in indexed journals (original studies and reviews) (n = 208).

TABLE 3: Number of articles published in indexed journal (original studies and reviews) published between 1982 and 2017 by study type.

	1982-1992 (n = 21) n (%)	1993-2003 (n = 70) n (%)	2004-2014 (n = 84) n (%)	2015-2017 (n = 33) n (%)	Total (n = 208) n(%)
Empirical articles					
Exploratory	5 (2.4)	16 (7.7)	24 (1 LS)	8 (3.8)	53 (25.5)
Descriptive	4 (1.9)	19 (9.1)	20 (9)	7 (3.4)	50 (24)
Correlation	<b>1</b> (0.5)	4 (1.9)	<b>11</b> (5.3)	<b>3</b> ( <b>1.4</b> )	19 (9.1)
Scoping	<b>1</b> (0.5)	9 (4.3)	8 (3.8)	4 (1.9)	22 (10.6)
Explanatory	0 (0)	1 (0.5)	4 (1.9)	0 (0)	5 (2.4)
Non-empirical articles	10 (4.8)	<b>21</b> ( <b>10.1</b> )	<b>17</b> (8.2)	<b>11</b> (5.3)	59 (28.4)

The percentages were calculated on the basis of the sample of articles published in indexed journals (original studies and reviews) (n = 208).

studies. The majority of the explanatory studies ( $n = 4$ ) converge in the period 2004-2014, as <loes a large share of the empirical scientific output  $n = 67$  (32.2%).

Figure 3 shows an increase in both trends. The empirical trend is more dominant in recent years. By calculating their linear average, we can observe how the gap widens between the two trends, with the nonempirical trend making more limited progress.

When comparing the first three periods, which last the same amount of time ( $n = 175$ ), a statistically significant relationship ( $p < 0.05$ ) is found between the periods and the methodology used in the articles. There is a statistically significant relationship between nonempirical articles and the period 1982-1992 ( $p < 0.05$ ), when compared with the other

periods. Furthermore, there is a statistically significant relationship between empirical articles and the period 2004-2014 ( $p < 0.05$ ), when compared with previous periods.

3.3. *Methodological Aspects of the Research.* The descriptive analysis of the methods used in the empirical articles is summarised in Table 4.

Overall, the percentage of qualitative articles published  $n = 72$  (48.3%) exceeds the percentage of quantitative articles, mixed articles, and reviews.

During the years 1982 to 1992, we can identify a greater number of qualitative studies ( $n = 8$ ) based on ethnographic and phenomenological approaches in comparison to quantitative and mixed studies ( $n = 3$ ). In the case of articles using

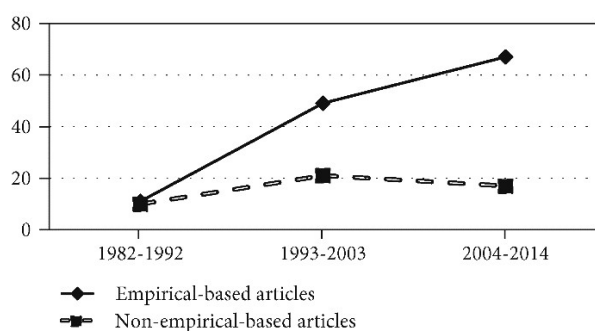


FIGURE 3: Evolution of the number of articles published in indexed journals (original studies and reviews) according to method.

quantitative methodology, we find the same number of experimental studies and observational studies. In this period, a study categorised as “qualitative and experimental” was identified, which from our point of view is a clear methodological error, because the description provided (qualitative and experimental) does not reflect the methodology used.

During the years 1993 to 2003, an increase is observed in both quantitative studies and in reviews and mixed research designs ( $n = 17$ ). Nevertheless, a greater number of qualitative articles ( $n = 32$ ) continue to be published, particularly ones using a phenomenological approach ( $n = 13$ ).

However, during the years 2004 to 2014, the trend from the previous period reverses. Quantitative studies ( $n = 29$ ) outweigh qualitative ones ( $n = 23$ ), and the number of literature reviews increases significantly.

In terms of possible correlations, we performed Fisher’s exact test (due to the existence of values  $n < 5$  in some categories) to analyse the major design approaches (quantitative, qualitative, mixed, and review) in relation to the first three periods described ( $n = 127$ ). We can confirm that there is a significant relationship between qualitative methodology and publications during the years 1993 to 2003 ( $p < 0.01$ ) and between quantitative methodology and publications with respect to the period 2004-2014 ( $p < 0.05$ ).

#### 4. Discussion

The results obtained in this scoping review allow us to answer the research questions posed at the outset of this paper. Regarding the first question, we have been able to describe the nature and volume of the research carried out on professional reasoning in occupational therapy. Since 1982, there has been a gradual and steady increase in the number of research articles on professional reasoning in occupational therapy, which may indicate a growing interest in this area of knowledge. In relation to this fact, it is fair to say that professional reasoning in occupational therapy has become a consolidated and ongoing line of research during the period studied.

Overall, research on professional reasoning in occupational therapy is empirical. Furthermore, qualitative research predominates, with the number of qualitative articles published exceeding the number of quantitative and mixed

methodology articles and reviews. This dominance of qualitative research on this topic is likely because qualitative techniques are appropriate to the nature of research questions about clinical reasoning because they allow in-depth responses and field notes on observations of clinical reasoning in practice. In addition, it may be also related to the predominance of qualitative research in our discipline during the eighties and the nineties. There has been only one systematic review with methodological rigour, conducted by Unsworth and Baker [4]. However, it did not involve a detailed analysis of the scientific rigour of the studies.

By mapping the research topics associated with professional reasoning, we have been able to identify three major lines of study: (a) professional reasoning in specific fields of practice, (b) professional reasoning among undergraduates, and (c) theoretical aspects of professional reasoning. Other relevant lines of study include modalities of reasoning and the differences in professional reasoning between novices and experts.

In light of these results, it appears that research on professional reasoning in occupational therapy is especially concerned with the particularities of reasoning in specific professional fields, to the detriment of the study of information processing that takes place in practice and that shapes professional reasoning in general [18]. This fact is reflected in the 25 articles classified under this category (information processing). We agree with Schell et al. [19] when they suggest that research on information processing could: “...help the occupational therapy community understand the applicability and limitation of information-processing models that are borrowed from research in other professions.” (p. 410). Furthermore, there is a lack of studies focused on the distinctive and unique modalities of reasoning that occur among occupational therapists [19]. In this scoping review, only 18 papers were identified in which the different modalities of professional reasoning were the focus of research. Despite the fact that these modalities of reasoning are frequently referred to in scientific literature [17], it appears that in-depth study of procedural, interactive, conditional, ethical, and pragmatic reasoning has not yet occurred. Therefore, we call on occupational therapists to continue to move beyond the limits established by information-processing models taken from other professions and to explore in more depth the unique and distinctive characteristics of professional reasoning in occupational therapy.

It should also be noted that publications from English-speaking countries predominate, particularly the United States, Britain, Australia, and Canada, followed by publications in Northern European and Spanish-speaking countries. This suggests that the clinical reasoning of OTs in developing countries has not been sufficiently studied, which is likely to limit the progression of OT practice in these countries [20–22]. This scoping review has broadened the search criteria of previous literature reviews to try to correct this bias.

With regard to the second research question, we have been able to describe how research on professional reasoning in occupational therapy has evolved. Our findings point to three historical periods with distinct characteristics: (a)

TABLE 4: Number of articles published in indexed journals (original studies and reviews) using empirical methods published between 1982 and 2017 by study design.

	1982-1992 ( <i>n</i> = 11) 11(%)	1993-2003 ( <i>n</i> = 49) 11(%)	2004-2014 ( <i>n</i> = 67) 11(%)	2015-2017 ( <i>n</i> = 22) 11(%)	Total ( <i>n</i> = 149) 11(%)
<b>Quantitative</b>					
Experimental	1 (0.7)	3 (2)	13 (8.7)	4 (2.7)	<b>21 (14.1)</b>
Cross-sectional non-experimental	0 (0)	7 (4.7)	11 (7.4)	3 (2)	21 (14.1)
Longitudinal nonexperimental	<b>1 (0.7)</b>	2 (1.3)	5 (3.4)	0 (0)	8 (5.4)
<b>Qualitative</b>					
Experimental	<b>1 (0.7)</b>	0 (0)	0 (0)	0 (0)	<b>1 (0.7)</b>
Cross-sectional nonexperimental	0 (0)	1 (0.7)	0 (0)	0 (0)	<b>1 (0.7)</b>
Grounded theory	0 (0)	0 (0)	4 (2.7)	4 (2.7)	8 (5.4)
Ethnographic design	3 (2)	8 (5.4)	6 (4)	3 (2)	20 (13.6)
Phenomenological design	3 (2)	13 (8.7)	9 (6)	1 (0.7)	26(17.7)
Action-research design	<b>1 (0.7)</b>	1 (0.7)	<b>1 (0.7)</b>	1 (0.7)	4 (2.7)
Narrative design	0 (0)	9 (6)	3 (2)	0 (0)	12 (8.2)
<b>Mixed</b>					
Concurrent	1 (0.7)	1 (0.7)	3 (2)	1 (0.7)	6 (4.0)
Sequential	0 (0)	1 (0.7)	4 (2.7)	1 (0.7)	6 (4.0)
Integrated	0 (0)	0 (0)	0 (0)	1 (0.7)	<b>1 (0.7)</b>
Review	0 (0)	3 (2)	8 (5.4)	3 (2)	14 (9.4)

The percentages were calculated on the basis of the sample of empirical articles (11 = 149).

exploratory phase (1982-1993), (b) transition phase (1994-2003), and (c) consolidation phase (2005-present).

In the exploratory phase (1982-1993), the scope of the research that would be developed in later literature is defined, described, and explored. This phase is characterised by non-empirical qualitative studies based on ethnographic and phenomenological approaches, which seems to indicate an exploratory perspective [23]. This thesis is consistent with the findings of Unsworth and Baker [4] and Harries and Harries [24], and with the statistically significant relationship we have identified between the nonempirical articles published and the period 1982-1993, when compared with the other periods.

In the transition phase (1994-2003), the number of studies increases considerably, the types of studies carried out diversify and there is also a significant increase in empirical studies, which outweigh nonempirical studies during these years. This increase in empirical studies is probably related to the need to support occupational therapy with more rigorous scientific research. However, among the empirical articles published during this period, qualitative articles with a phenomenological approach predominate. According to the data analysed, this theory is consistent with the statistically significant relationship found between this phase and the use of qualitative methodology. It is likely that, although researchers were still seeking to develop a rich descriptive image of professional reasoning, the available scientific methods at that time were becoming more rigorous in the field of health sciences. These findings seem to indicate a transition period in the research, during which new research perspectives are developed, while the earlier ones continued to predominate [24].

In the consolidation phase (2005-present), the research trend is clearly reversed, with a quantitative approach predominating and an increase in the number of literature reviews. These findings indicate that, in recent decades, research on professional reasoning has reached a period of consolidation, adopting a variety of both qualitative and quantitative approaches, although qualitative studies still predominate [25]. This thesis is consistent with the statistically significant relationship found here regarding empirical articles using quantitative methodology and the period 2004-2014, when compared with previous years. In addition, almost a third of the studies published during that period were reviews and experimental designs, which indicates a research trend to achieve a higher level of scientific evidence.

**4.1. Limitations.** A detailed analysis of the findings of the papers included in this review was beyond the scope of this study. Moreover, this scoping review did not assess the scientific quality of the literature analysed, which may be considered a limitation of the study.

**4.2. Future Research.** Future lines of research need to assess the methodological quality and scientific evidence arising from studies on professional reasoning in occupational therapy. From our point of view, conducting a study to assess the quality of the publications and the existing evidence is imperative.

It would be interesting for research in this area to encompass a greater number of non-English-speaking countries in order to gather information about the cultural and ethical particularities of professional reasoning [8, 19, 26].

## 5. Conclusions

Research and literature about professional reasoning in occupational therapy is a rising field of knowledge, through which occupational therapists increase their understanding of the mechanisms that regulate the selection and evaluation of occupational therapy interventions. The research about professional reasoning in occupational therapy has increasingly involved empirical research, in which qualitative studies predominate. However, there is still a relative lack of quantitative and mixed methods studies, as well as a dearth of systematic reviews about the quality of existing studies. Principal lines of research focus on specific fields of practice, undergraduates, and theoretical aspects of professional reasoning. There are relatively few studies focused on information processing, modalities, and unique characteristics of professional reasoning in occupational therapy. Three historical phases were identified with common features in terms of objectives and research methods: (a) exploratory phase, characterised by nonempirical studies; (b) transition phase, in which there is a considerable increasing diversification of the lines and methods of research; and (c) consolidation phase, in which evidence-based research perspectives and more quantitative studies emerge. Overall, the research about professional reasoning in occupational therapy during the next years should target the in-depth study of the basic process of information processing and the reasoning modalities that define the occupational therapy professional reasoning.

## Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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## References

- [1] B. A. Schell, G. Gillen, and M. Scaffa, "Glossary," in *Willard and Spackman's Occupational Therapy*, B. A. Schell, G. Gillen, and M. Scaffa, Eds., Lippincott Williams and Wilkins, Philadelphia, 12th edition, 2014.
- [2] B. A. Schell and J. W. Schell, "Professional reasoning as the basis of practice," in *Clinical and Professional Reasoning in Occupational Therapy*, B. A. Schell and J. W. Schell, Eds., Lippincott Williams and Wilkins, Philadelphia, 2008.
- [3] M. A. Talavera, *Estudio del razonamiento clínico en estudiantes de terapia ocupacional*, Universidade A Coruña, Dissertation, 2015.
- [4] C. A. Unsworth and A. Baker, "A systematic review of professional reasoning literature in occupational therapy," *British Journal of Occupational Therapy*, vol. 79, no. 1, pp. 5–16, 2016.
- [5] C. Chapparo and J. Ranka, "Clinical reasoning in occupational therapy," in *Clinical Reasoning in the Health Professions*, J. Higgs and M. Jones, Eds., Butterworth-Heinemann, Oxford, 2nd edition, 2000.
- [6] E. S. Cohn, "Clinical reasoning: explicating complexity," *American Journal of Occupational Therapy*, vol. 45, no. 11, pp. 969–971, 1991.
- [7] D. Robertson, F. Warrender, and S. Barnard, "The critical occupational therapy practitioner: how to define expertise?," *Australian Occupational Therapy Journal*, vol. 62, no. 1, pp. 68–71, 2015.
- [8] B. Hooper, "Therapists' assumptions as a dimension of professional reasoning," in *Clinical and Professional Reasoning in Occupational Therapy*, B. A. Schell and J. W. Schell, Eds., Lippincott Williams and Wilkins, Philadelphia, 2008.
- [9] R. C. Schaaf, "Creating evidence for practice using data-driven decision making," *American Journal of Occupational Therapy*, vol. 69, no. 2, pp. 6902360010p1–6902360010p6, 2015.
- [10] L. K. Matthews, C. M. Mulry, and L. Richard, "Matthews model of clinical reasoning: a systematic approach to conceptualize evaluation and intervention," *Occupational Therapy in Mental Health*, vol. 33, no. 4, pp. 360–373, 2017.
- [11] A. Turner and A. Alsop, "Unique core skills: exploring occupational therapists' hidden assets," *British Journal of Occupational Therapy*, vol. 78, no. 12, pp. 739–749, 2015.
- [12] H. Arksey and L. O'Malley, "Scoping studies: towards a methodological framework," *International Journal of Social Research Methodology*, vol. 8, no. 1, pp. 19–32, 2005.
- [13] D. Levac, H. Colquhoun, and K. O'Brien, "Scoping studies: advancing the methodology," *Implementation Science*, vol. 5, no. 1, pp. 1–9, 2010.
- [14] A. P. Serrata, R. Gomes, and R. Esquerdo, "Occupational justice and its related Concepts," *OTJR: Occupation, Participation and Health*, vol. 36, no. 4, pp. 167–178, 2016.
- [15] B. Hutton, F. Catalá-López, and D. Moher, "The PRISMA statement extension for systematic reviews incorporating network meta-analysis: PRISMA-NMA," *Medicina Clínica*, vol. 147, no. 6, pp. 262–266, 2016.
- [16] J. C. Rogers and G. Masagatani, "Clinical reasoning of occupational Therapists during the initial assessment of physically disabled Patients," *Occupational Therapy Journal of Research*, vol. 2, no. 4, pp. 195–219, 1982.
- [17] B. A. Schell and R. Cervero, "Clinical reasoning in occupational therapy an integrative review," *American Journal of Occupational Therapy*, vol. 47, no. 7, pp. 605–610, 1993.
- [18] A. E. Roberts, "Clinical reasoning in occupational therapy: idiosyncrasies in Content and process," *British Journal of Occupational Therapy*, vol. 59, no. 8, pp. 372–376, 1996.
- [19] B. A. Schell, C. A. Unsworth, and J. W. Schell, "Theory and practice: new directions for research in professional reasoning," in *Clinical and Professional Reasoning in Occupational Therapy*, B. A. Schell and J. W. Schell, Eds., Lippincott Williams and Wilkins, Philadelphia, 2008.
- [20] D. Castro, S. Dahlin-Ivanoff, and L. Mårtensson, "Occupational therapy and culture: a literature review," *Scandinavian Journal of Occupational Therapy*, vol. 21, no. 6, pp. 401–414, 2014.
- [21] K. W. Hammell, "Self-care, productivity, and leisure, or dimensions of occupational experience? Rethinking occupational categories," *Canadian Journal of Occupational Therapy*, vol. 76, no. 2, pp. 107–114, 2009.
- [22] I. Zango, J. A. Flores, P. Moruno, and A. Björklund, "Occupational therapy culture seen through the multifocal lens of

- fieldwork in diverse rural areas,” *Scandinavian Journal of Occupational Therapy*, vol. 22, no. 2, pp. 82–94, 2015.
- [23] R. Hernández, C. Fernández, and P. Baptista, *Metodología de la investigación*, Mc Graw Hill, México, 6th edition, 2014.
- [24] P. A. Harries and C. Harries, “Studying clinical reasoning, part 1: have we been taking the wrong “track”?”, *British Journal of Occupational Therapy*, vol. 64, no. 4, pp. 164–168, 2001.
- [25] S. H. Lin, S. L. Murphy, and J. C. Robinson, “Facilitating evidence-based practice: process, strategies, and resources,” *American Journal of Occupational Therapy*, vol. 64, no. 1, pp. 164–171, 2010.
- [26] B. Hooper, “The relationship between pretheoretical assumptions and clinical reasoning,” *American Journal of Occupational Therapy*, vol. 51, no. 5, pp. 328–338, 1997.





## 5.2. A Q-method approach to perceptions of professional reasoning in occupational therapy undergraduates

## RESEARCH

## Open Access



# A Q-method approach to perceptions of professional reasoning in occupational therapy undergraduates

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### Abstract

**Background:** Professional reasoning provides a firm basis for the development of teaching and assessment strategies to support the acquisition of skills by healthcare students. Nevertheless, occupational therapy educators should use diverse methods of learning assessment to examine student learning outcomes more fully with an evaluation that supports the overall complexity of the process, particularly learners' subjective experience. The aim of this article is to identify the range of perspectives among occupational therapy undergraduates regarding terms or concepts that are key for improving their professional reasoning.

**Methods:** Q-methodology was used to address the aim of the study. A concourse relating to a series of ideas, phrases, terminology, and concepts associated with various studies on professional reasoning in occupational therapy, specifically on students in this field, was generated. The terms that had the clearest evidence, the most relevance or the greatest number of citations in the literature were collected ( $n = 37$ ). The P-set was assembled by non-probabilistic sampling for convenience. It comprised undergraduate university students in occupational therapy. Factor analysis was conducted using Ken-Q Analysis v.1.0.6, reducing the number of Q-sets to smaller groups of factors representing a common perspective.

**Results:** Through statistical analysis of the Q-sorts of 37 occupational therapy students, 8 default factors were identified. The four factors in accordance with the selection criteria were rotated by varimax rotation to identify variables that could be grouped together. Each viewpoint was interpreted, discussed and linked to different aspects of professional reasoning in occupational therapy.

**Conclusions:** The observed perceptions were linked to the various aspects of professional reasoning that have been widely discussed in the occupational therapy literature. For most of the students, there was a strong correspondence between the narrative, interactive and conditional aspects of the various components.

**Keywords:** Professional reasoning, Q-method, Occupational therapy / education, Clinical decision-making, Problem solving, Students, health occupations

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## Background

In occupational therapy, professional reasoning is defined as the process by which professionals plan, direct, carry out and reflect on the client's treatment [1, 2]. Its importance is based on its relationship with professional practice, which gives the professional the ability to manage the process of assessment, planning and implementation of the intervention, structuring it within its environment and influencing the effectiveness of the work performed [1, 3, 4].

The development of effective professional reasoning has been the primary objective of occupational therapy studies for many years [5, 6], and clinical courses provide the opportunity to refine these skills [6–8].

As Márquez-Álvarez et al. [9] explain, one of the main areas of research in the literature over the years has been the study of these professional reasoning skills in students, amounting to 20% of publications on professional reasoning in occupational therapy. Nevertheless, few references discuss this topic from the subjective perspective of the student. Neistadt [10] was the first to discuss this topic, starting from the various pedagogical tools that improve the acquisition of the skills necessary to build expertise in the professional domain [10–13]. Although professional reasoning is not a novel concept, instructors in healthcare tend to focus their teaching on how to think like a professional based on specific terminology and the use of strategies that improve decision-making through reflection. Professional reasoning is a complex and multifaceted concept that is described and used in very different ways by different authors [11, 14]. Clarity regarding its nature and a shared understanding of the range of uses of professional reasoning provide a firm basis for the development of teaching strategies to support the acquisition of this skill by healthcare students [15]. According with Blumberg [16], instructors need to plan how students will practice engaging with content that requires these different types of knowledge and not assume that they will learn the conceptual or procedural knowledge by attending lectures or demonstrations. For this it is necessary to ask students to reflect on their own learning processes and to assess their learning progress.

According to Dutton [17], professional reasoning skills differ significantly between experienced practitioners and new graduates: “The better our understanding of expert practice and how experts reason, the greater our capacity to provide this complex and often tacit knowledge to novices to hasten and progress their journey to expertise” ([4] p14). The importance of professional reasoning in higher education programmes as a mean to develop professional habits, skills and thinking has gained importance over the years as “learning needs to emphasize reflection on thinking rather than just

equipping learners with process-following or decision-making skills” ([18] p2). The way in which novices organise their knowledge to analyse and synthesize the information gathered during the initial assessment is an element of primary importance to acquire proper professional reasoning during their academic education [19].

To analyse this reasoning, current theories [20] recognise that both analytical and non-analytical processes work together and interact mutually, so studying reasoning while separating these processes leads to an oversimplification of the conclusions obtained. Instead of attempting to focus on specific issues or attributes like problem solving or decision making, modern learning assessments tend to look for the development of an evaluation that supports the overall complexity of the process [20]. This excludes those studies that are linked to key responses or based on a “single answer” as the best solution to a problem. New concrete approaches – quantitative, qualitative, and mixed – have arisen from this perspective, such as case studies, multiple-choice questions, threshold concepts or other standardised tests [14, 21–24]; however, there is much to explore in the field of occupational therapists' professional reasoning as many terms and issues are interwoven in the literature [18]. In this terms, Q-sort is one example of a modern assessment that can be used to identify and potentially assess learner knowledge about professional reasoning. There seems to be a need to identify the limits and edges of professional reasoning and its evolution over the years as many of its determinants remain unknown and lack consensus [18, 25–27]. To educate quality practitioners, there is a need to adequately explore the insights of undergraduate occupational therapy students to ensure the efficiency of educational programmes and to minimize the gap between study and professional/clinical practice [18, 21]. From this point of view, Q-sort is a method of assessment that aligns with measuring learning outcomes in regard to development of professional reasoning.

The aim of this article is to identify the range of perspectives among occupational therapy undergraduates regarding terms or concepts that are key for improving their professional reasoning. How do undergraduate occupational therapy students perceive the relevance of the different elements that interact within their professional reasoning learning?

To answer these questions, we chose to use Q-methodology, which incorporates aspects of both quantitative and qualitative techniques to examine human subjectivity [28]. The complementary treatment of quantitative and qualitative methods provides subjectivity within a rigorous and objective process [29].

Q-methodology is a tool that enables a better understanding of people's perspectives and their beliefs, which

are generated and explored through a specific method of data collection and statistical analysis [30]. It has been applied to the improvement of higher education programmes and to quality and healthcare policies with good results [31, 32]. Its use in educational settings allows the experience and perspective of students to be explored as a means of improvement and allows variations to be examined with scientific evidence. Therefore, it is possible to identify participants' viewpoints by requesting individuals to undertake an operant procedure (sorting related statements).

## Methods

### Design

Q-methodology enables the subjectivity of participants to be preserved through an objective process in which each participant provides his or her perspective by ordering different terms or phrases according to a predetermined study question [33]. It uses a specific statistical method called factor analysis, that reduces a large number of variables into a smaller number of factors to group people according to how they interpret statements about a topic [31]. From this position, the current study is descriptive, exploratory, and transversal, centred on individual and subjective perspectives.

### Concourse development

A concourse relating to a series of ideas, phrases, terminology, and concepts associated with various studies on professional reasoning in occupational therapy, specifically on students in this field, was generated. This review was conducted retrospectively according to the PRISMA methodology [34], and information was collated relating to professional reasoning in occupational therapy students between 1986 and 2020. The formal literature search was conducted across the following databases: OTDBase, CINAHL, Medline, WOS, Embase, Scopus, ISOC, Latindex, LILACS, LivRe, ProQuest, CSIC (Spanish National Research Council) and Dialnet. An initial search strategy (October 2020) was created for Medline (using PubMed) and was adapted to each search: ("Occupational Therapy"[Mesh]) OR ("Allied Health Occupations"[Mesh] OR "Allied Health Personnel"[Mesh]) AND ("clinical reasoning" OR "professional reasoning") AND (students OR undergraduates). After applying the selection criteria, we identified 44 references of interest.

### Development of the Q-set

The Q-set is a set of statements representative of the majority of ideas present in the opinions of the field of study [35]. In this case, to prepare the initial set, there were collected all the terms which were related in any way to professional reasoning according to most cited

authors, greatest levels of evidence in the studies and appeared most repeatedly in the specific issues from professional reasoning literature. A group of the study authors (LJMA, MATV and PMM) separately created different sets that were subsequently combined by eliminating duplicates and combining terms with similar definitions or characteristics. Finally, a list of  $n = 37$  terms and statements was prepared (Table 1). There was no subsequent modification to this sample.

### Selection of the P-set

The P-set (set of participants) [36] was assembled by non-probabilistic sampling for convenience. It comprised undergraduate university students in occupational therapy who wished to take part in the study. The students had some knowledge of the discipline and of the terms offered in the list (at least second year of study) and had access to computer equipment to complete the data collection forms.

Given that the Q-methodology seeks to identify the different opinions within this group of participants, there is no need to make a maximum sample size calculation. In accordance with the literature and following the indications of Watts & Stenner [37], an approximate 1:1 ratio of terms to people interviewed is required to conduct the study. The number of participants should not exceed the number of terms or phrases used. Therefore, 37 students participated in the study, including any volunteer who was willing to take part in the study was included until reach the specified number.

### Q-sort

The participants were recruited in November 2020 from the different courses in the Degree in Occupational Therapy from Faculty Padre Ossó in Oviedo. They assessed the Q-set statements on a continuous scale with a quasi-normal distribution between "most relevant" and "least relevant". A preliminary session was used to explain all possible doubts and to discuss the meaning of all the statements, although all participants had read them previously. The following premise was presented to them to perform the sort:

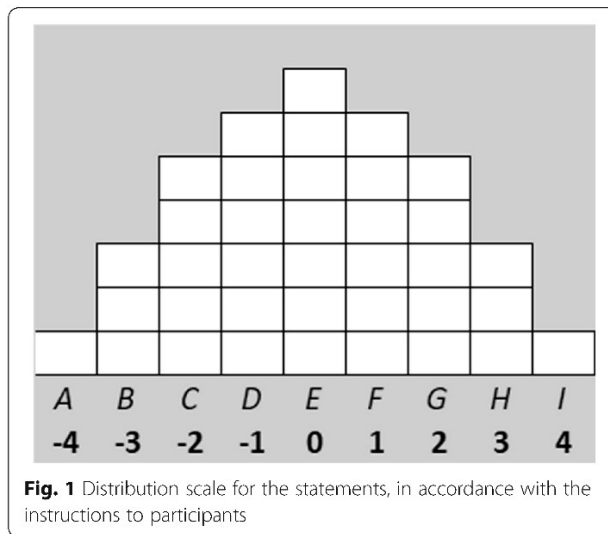
*"The aim of this activity is to know your own perceptions about the importance of some terms in using clinical reasoning in occupational therapy. Following this text, you are going to see a table that represents a normal curve (like a Gaussian distribution), and each column has its own value (for example, F has a value of 1). (Figure 1)*

*Next, you will find a list of 37 terms. I would like you to put each of them in the square where, according to your preference, it should be placed in terms of relevance for clinical reasoning in occupational*

**Table 1** Q-set statements and terms prepared for Q-sort

Statement Num.	Statements
1	Cooperative learning
2	Experimental learning
3	Individual learning
4	Self-assessment
5	External aid
6	Functionality of the client
7	Contact with people with disabilities
8	Procedural reasoning
9	Pragmatic reasoning
10	Main diagnosis
11	Disability
12	Illness
13	Ethical reasoning
14	Assessments of the client
15	Professional experiences
16	Academic education
17	Scales and forms to assess
18	Narrative reasoning
19	Interactive reasoning
20	Frames of reference
21	Improve skills as student
22	Mentor
23	Models of practices
24	Aims of intervention
25	Think as therapists
26	Conditional reasoning
27	Images of people with disabilities
28	Intervention planning
29	Clinical practice
30	Main problem of the client
31	Referents in own learning
32	Community reinsertion
33	Problem solving
34	Individual responsibility
35	Roles of the client
36	Routines of the client
37	Specific vocabulary and terminology

*therapy. Remember, you cannot repeat any of the squares or use more than the given ones (you can use the numbers to guide you). For example, if you put the professional experience term over the "I" column, it means that it is very important to you at the time for your own reasoning. However, maybe you think it is not so important, so you could put it in*



**Fig. 1** Distribution scale for the statements, in accordance with the instructions to participants

*the "E" column, or maybe you think it is not important at all, so you should put it in the "A" column".*

The 37 statements were classed on a scale with a [- 4, + 4] distribution of ranks, with 9 columns in total (Fig. 1).

The statements were classed on the scale using the Microsoft Excel 365 program given that all participants had access to this software. Statements should normally be classed using cards, but the method using Microsoft Excel was chosen for reasons of hygiene due to the COVID-19 situation. At the end of each document, the participants had a space in which they could include comments about statements they believed should have been included and that could be relevant as well as any observations regarding how they had made their choice.

**Factor analysis**

The factor analysis was conducted using Ken-Q Analysis v.1.0.6 (available from <https://shawnbanasick.github.io/ken-q-analysis/>). Factor analysis was used to reduce the number of Q-sets to smaller groups of factors representing a common perspective [36]. The process consisted of the following selection criteria for the extraction of factors based on the criteria of Garbellini et al. [33] and their review of the work of Chee, Lee, Patomella & Falkmer [37] and Thompson, Elliot, Willis, Ward, Falkmer et al. [38]. An additional step (no. 5) was added as a possibility given the characteristics of the software.

1. The starting point was the default number of factors extracted by the Ken-Q Analysis software, a total of 7 factors.
2. Factors with an eigenvalue greater than 1.0 were included.
3. At least two significant factor loadings were required for each retained factor.

4. The cross-product of the two highest loadings should be greater than twice the standard error (SE) (Humphrey's rule). SE was calculated using the formula  $SE = 1/\sqrt{n}$ , where  $n$  = number of statements in the Q-set. Therefore, loadings of  $2 \times 1/\sqrt{37}$  (factor loadings  $> 0.3288$ ) identified Q-sorts correlated with each factor.
5. In the auto-flagging of factors, all with  $p > 0.01$  were excluded.
6. All factors displayed prior to the levelling of the scree plot (Fig. 2) should be retained.

### Interpretation of factors

The interpretation of each factor was performed in three steps: a) each factor was analysed at a general level; b) the statements at the two extremes (values of - 4, - 3, + 3 & + 4) were analysed together to observe the counterpoint of perceptions and compare them to the existing literature.

This comparison enabled the identification of the various viewpoints and their influence on the student's learning as well as how the result could be usefully extrapolated.

### Results

Responses were obtained from 15 s-year students and 22 third-year students, 8 males and 29 females, with an age

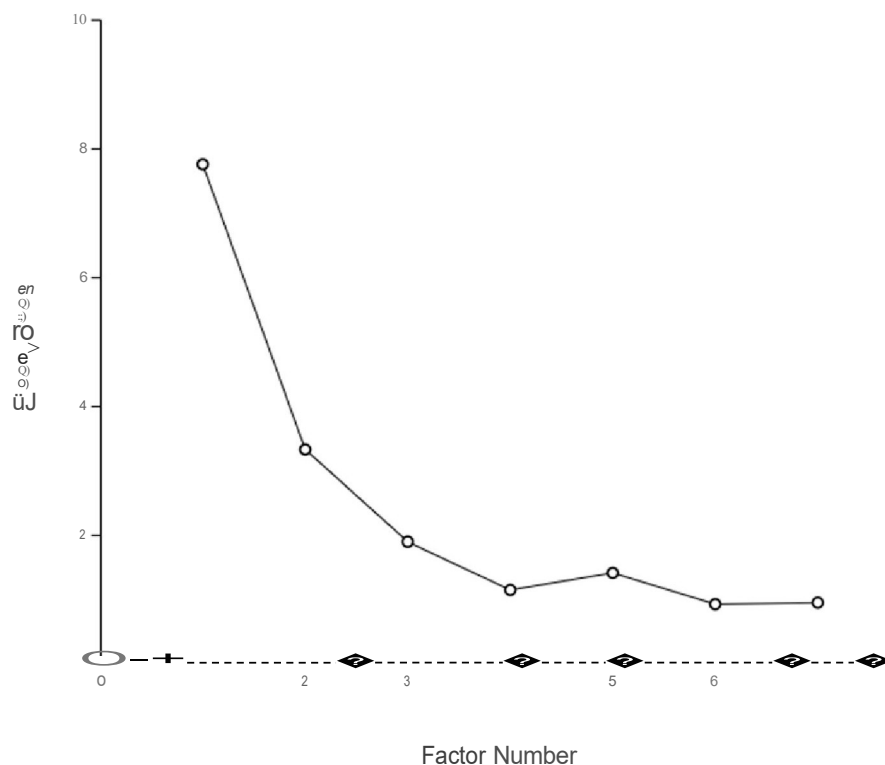
of  $X = 19.757$  ( $sd = 1.116$ ). The second-year students had just started to examine clinical cases oriented towards specific areas of [clínica] practice (older patients, joint disease and mental health), while the third-year students had one more year of experience.

The analysis of the Q-sorts of the 37 participants created 8 default factors that were centred on 4 viewpoints in accordance with the selection criteria (see Table 2 and Fig. 2). All viewpoints included Q-sorts from both years, showing representability of the student body in general; however, it was not possible to show an effect of additional practice or study. The four selected factors were rotated by varimax rotation to identify variables that could be grouped together and to maximize the set of mutually distinct observations [39] (see Fig. 3 for the legend of viewpoints).

Following the steps in the method, each factor will be summarized by the statements at the two extremes (values of - 4, - 3, + 3 & + 4),

### Retained factor 1: viewpoint 1 - focus on client and results

The first viewpoint (Fig. 4) was named because of the counterpoint of two aspects that are very different for training but have statements that are closely linked to the client and to the client's experience in clinical and day-to-day terms.



**Fig. 2** Eigenvalues of the retained factors extracted from the software

**Table 2** Application of selection criteria following Garbellini et al. [28]; Y = Yes; N=No

Selection criteria	1	2	3	4	5	6	7
Default factors							
Eigenvalue (value needed > 1.0)	7.746	3.321	1.893	1.146	1.41	0.924	0.948
Number of factor loading > 0.3288	11	2	5	1	3		
Humphrey's rule succeeded	Y	Y	Y	N	Y	-	-

On the one hand, aspects of client contact are found at the high end of the curve, such as “interactive reasoning”, “community reinsertion” and “roles of the client”. At the other end of the scale are statements such as “frames of reference”, “main diagnosis” and the concept of “illness”. As shown in the figure, in many cases, the priority for resolution of the clinical case does not seem to be understood as involving learning but as a problem to be solved.

**Retained factor 2: viewpoint 2 – focus on academic learning**

In contrast to the first viewpoint, there appears to be a greater balance of academic and day-to-day aspects in this view (Fig. 5). It is the only one in which “specific vocabulary and terminology” receives some importance, but only in the centre of the bell curve and without extreme values.

The statements viewed as most important are “ethical reasoning”, “cooperative learning” and “academic education”. Statements related to personal care, such as “images of people with disabilities” or “contact with people with disabilities”, are seen as less important. There seems to be a more academic view in which cases are resolved in a methodical way linked to the learning process.

**Retained factor 3: viewpoint 3 – focus on the process**

The title of this viewpoint (Fig. 6) comes from the large number of components linked to the occupational therapy process in general, which is perceived as more important. Aspects such as “aims of intervention” and “think as therapists” are seen as relevant, but not as much as the process of assessment and intervention, with the principal axes in “intervention planning” and “functionality of the client”. On the other hand,

statements such as “referents in own learning” and “mentor” are rated negatively.

**Retained factor 5: viewpoint 4 – focus on nonspecific learning**

In viewpoint 4 (Fig. 7), there is a clear vision of the mechanistic aspect governing reasoning. The most highly rated aspects are “procedural reasoning” and “assessments of the client”, with “main diagnosis” and “illness” completely opposed to the other viewpoints.

Constructs that are entirely relevant for learning professional reasoning, such as “models of practice” and “frames of reference”, as well as individual aspects of the client’s life, such as “roles” or “routines”, are found in the lowest-rated areas.

**Discussion**

To our knowledge, this is the first study to explore professional reasoning in undergraduate students from a Q-methodology perspective. Q-methodology allows us to explore subjectivity from students’ point of view and to better understand their areas of priority to improve their training [40, 41]. Its use enables the exploration of beliefs about the user, the process, and users’ own training and reflection on the aspects that they consider necessary. This approach is in accordance with the purpose of our research question because it develops not only the complexity of professional reasoning but also the possible ranks or comparisons in terms of unanimous statements. Professional reasoning is a key aspect of training within academic programmes that prepares students to take on professional responsibilities. There is a need to develop such programmes to improve the development of students’ abilities, which is vital for professional life [42, 43], and to use innovative assessments of student

- \* Distinguishing statement at P< 0.05
- \* \* Distinguishing statement at P< 0.01
- ▶ z-Score for the statement is higher than in all other factors
- ◀ z-Score for the statement is lower than in all other factors

**Fig. 3** Legend for the viewpoints

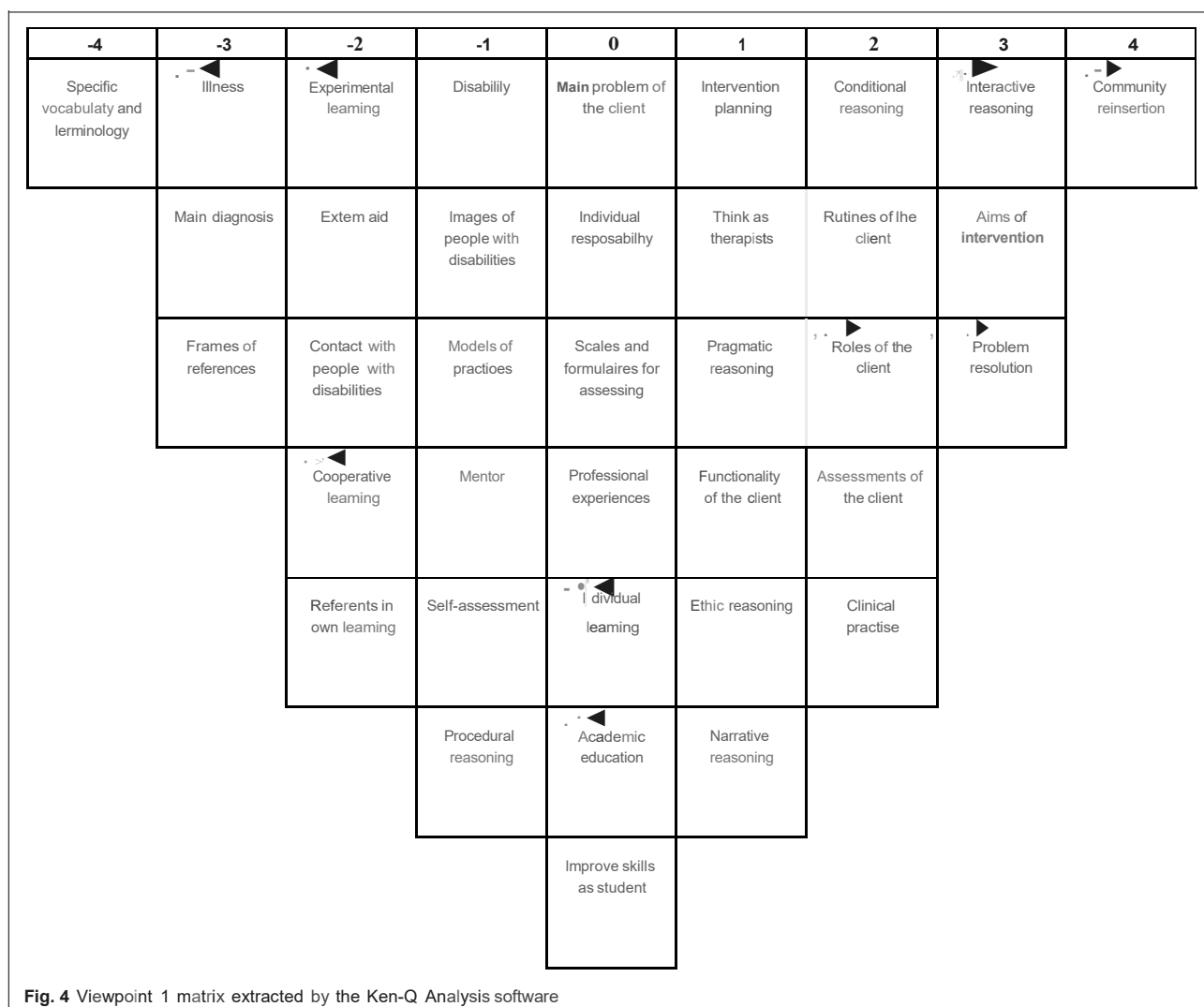


Fig. 4 Viewpoint 1 matrix extracted by the Ken-Q Analysis software

learning, such as Q-sort, to understand learners' perspectives and experiences.

Referring to our research question about how students perceive the relevance of the different elements that interact within their professional reasoning learning, it seems there is no consensus even for the same programme of study. Programmes should emphasise different priorities to develop professional reasoning to the extent of a quality practitioner's abilities, but the personal context of each student can be seen as biased in that education.

This can be understood with reference to Neistadt's analysis [11] of the methodological requirements for the teaching of skills related to professional reasoning, which include the use and development of specific terminology to generate precise thought processes early on and to provide a certain capacity for self-evaluation: "An important reason for building a language to describe the often tacit thought processes of occupational therapists

is so that expert therapists can communicate more easily with students and novices and thus promote reasoning skills among students" ([4] p6). Nevertheless, in three of the four viewpoints, the statement "specific vocabulary and terminology" was placed in a low position. This could be because training programmes are not delivered appropriately or because their impact on students is lower than it should be.

On the other hand, the overall visions of each of the viewpoints take on meaning and comparative capacity when examining concepts related to aspects of reasoning in occupational therapists. An "aspect" refers to the different perspectives on both the nature of the process and the focus or content about which therapists reason. The aspects or tracks of reasoning in occupational therapy include procedural, interactive, conditional, narrative, pragmatic, scientific, ethical, and diagnostic reasoning [4, 44]. If we aim to explore the perception and relevance of the elements that construct reasoning,

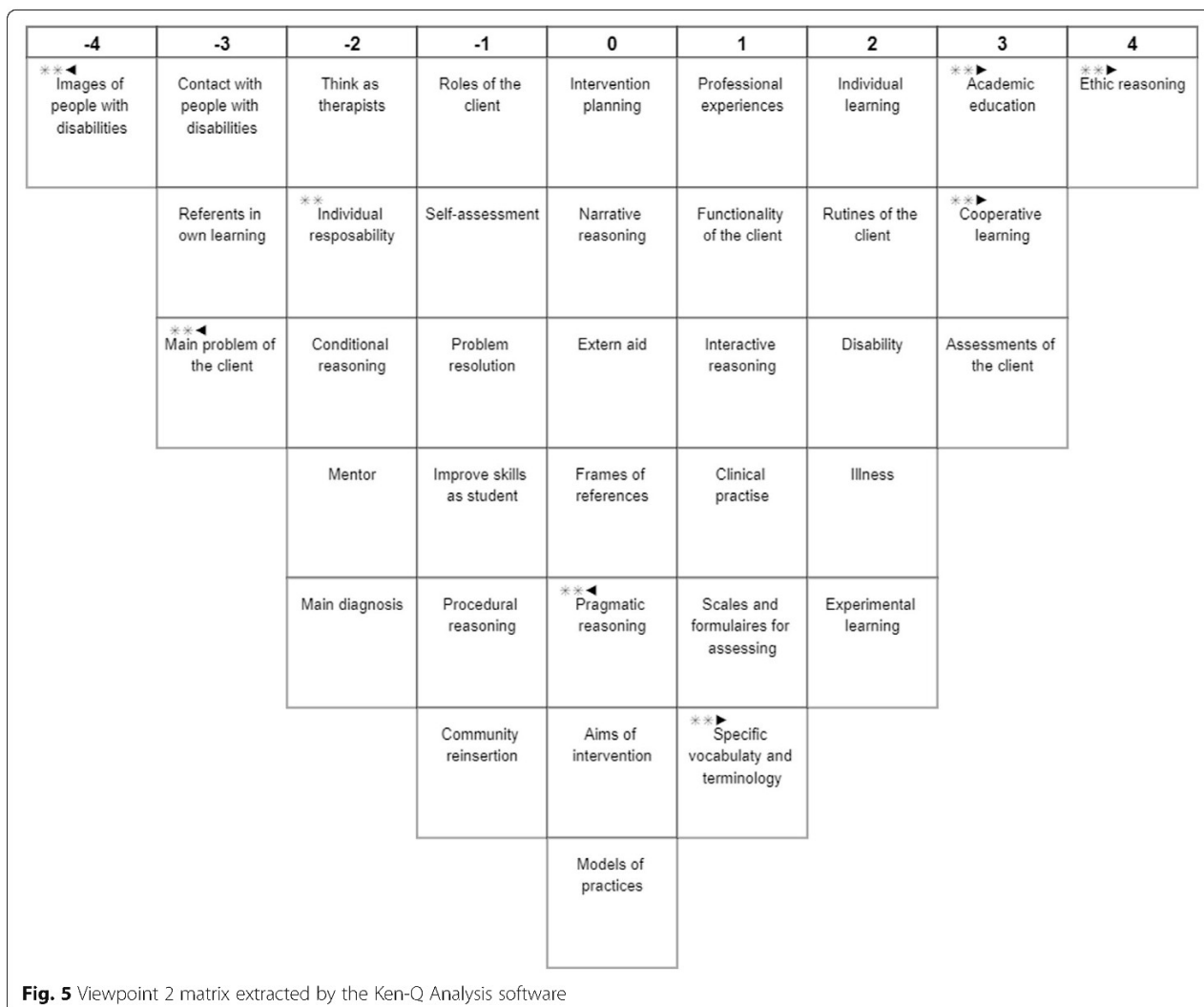


Fig. 5 Viewpoint 2 matrix extracted by the Ken-Q Analysis software

the concept of aspects seems to be more relevant than the specific cognitive process because each of the predominant aspects is associated with some key terms. If we compare the different viewpoints using this concept, they all seem to reflect, more or less tacitly, aspects of professional reasoning in the context of occupational therapy students. In Table 3, key concepts of each viewpoint for the discussion are associated with the different aspects of reasoning.

In this way, viewpoint 1, the majority viewpoint with an eigenvalue of 7.746, prioritises the construction of an occupational life history. A large part of this viewpoint seems to cover the search for autonomy and independence for the person receiving the services, and this search can be seen as more important than the direct learning process. Statements such as “interactive reasoning” and “community reinsertion”, which are related to the client’s experience, life and future, have their own narrative for students that involve their own life

situation. As such, this typology can be seen as a combination of narrative, conditional and interactive reasoning. These aspects promote awareness of the experience of illness and of the various styles of interaction [44].

There is a reflex towards procedural reasoning in the two viewpoints, although in very different ways. Procedural reasoning uses a series of scientific bases on reasoning to create, test and use knowledge to make decisions. Scientific reasoning also partly overlaps with evidence-based practice in that both are concerned with the evaluation and application of research evidence to clinical practice [44]. Depending on whether these bases are specific to occupational therapy or outside its remit, the applicable perspective could be viewpoint 2 or viewpoint 4, respectively. In the former, care is centred on the points of application defined by Schell and Schell as “frame of reference selection”, “occupational profile” and “analysis of occupational performance”; the latter makes reference to “referral” [44]. The former could support



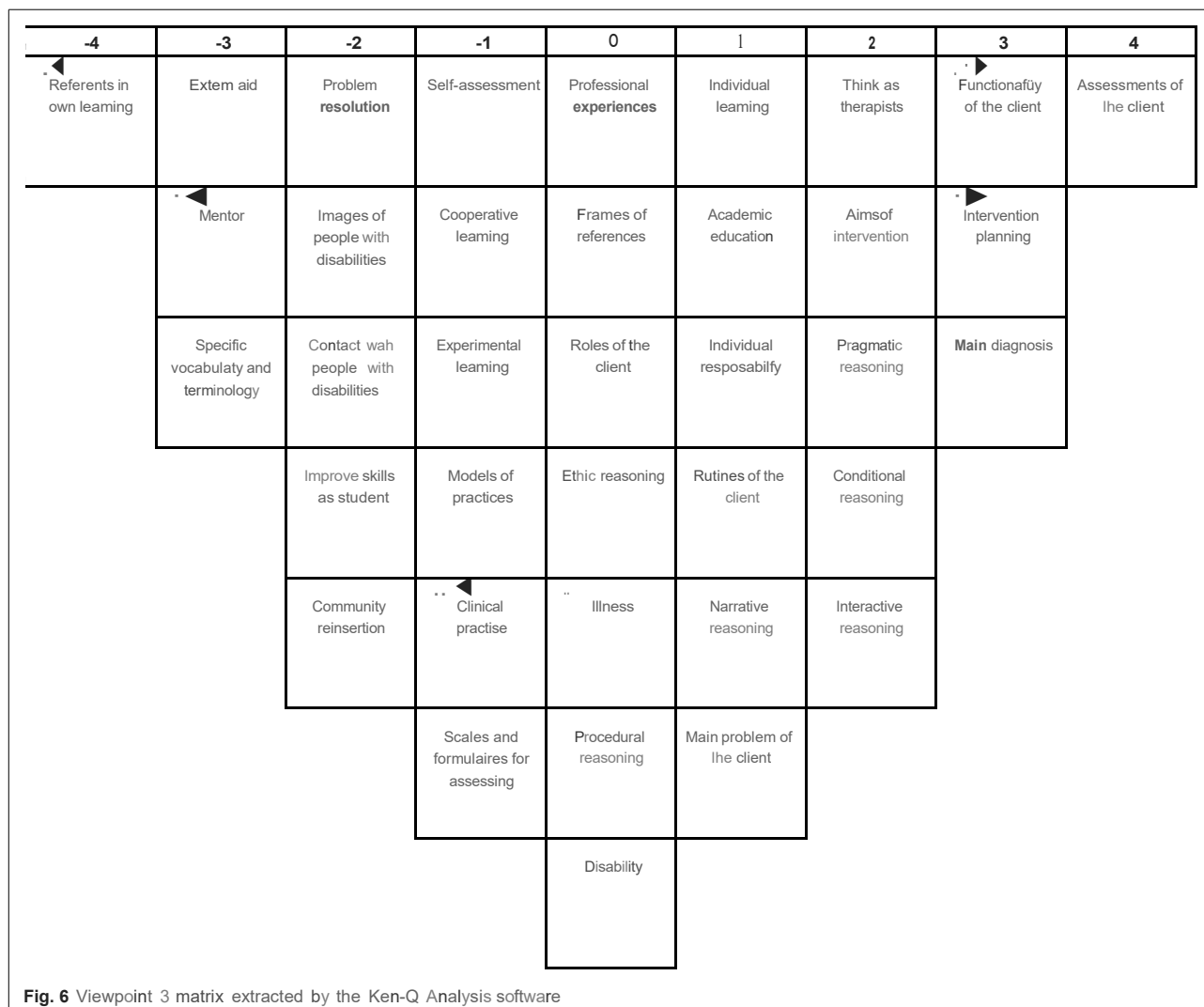


Fig. 6 Viewpoint 3 matrix extracted by the Ken-Q Analysis software

learning in occupational therapy in a stronger way, directly using its scientific foundations based on thought aspects that are strongly related to higher cognitive processes and linked to learning. The latter could abstract the student from the direct occupational therapy intervention, with the focus of attention being diagnostic aspects or problems other than occupation.

Finally, in viewpoint 3, the content of a large number of statements seen as important could indicate a more scientific vision related to "procedural reasoning". Nevertheless, there are statements with a value of + 2 that are related to aspects of direct contact with clinical experience and the client, and almost all statements are related to aspects of higher thought. The negative rating of some statements related to referent figures may suggest the loss of the figure of a teacher or professional that is replaced by a vision of the whole process. This type of viewpoint could be oriented towards self-learning or the need to internalize certain concepts of

the occupational therapy procedure more than in the resolution of cases.

Viewpoint 3 is perhaps the more conclusive evidence. It downplays external reference points while searching for individual development and conducting a direct analysis with priorities such as diagnosis, the client's principal complaint, assessment or functionality. This seems to describe the characteristics of pragmatic reasoning, which reflect an immediate intent to resolve the case (45). Pragmatic reasoning is centred on the day-to-day realities that occur in the department while considering the contextual factors that inhibit or facilitate therapy (46). Although it is impossible to see pragmatic reasoning in a simulated exercise because there is no real-life context, it can be inferred from a predisposition to immediate action with components of direct intervention. This reasoning seeks to build awareness among students of aspects of clinical practice; however, there is no framework of ethics or sensitivity beyond that which is

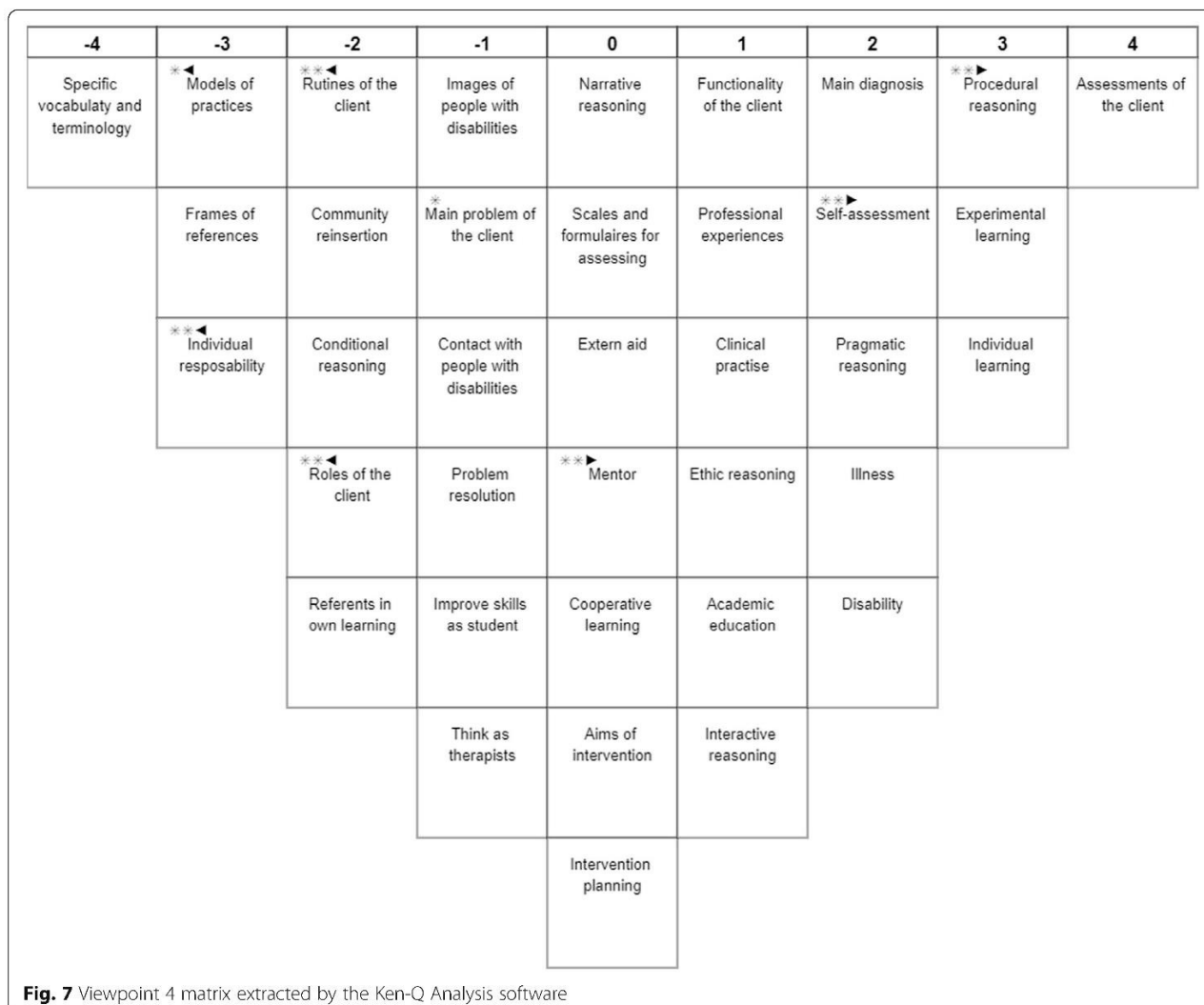


Fig. 7 Viewpoint 4 matrix extracted by the Ken-Q Analysis software

Table 3 Key concepts discussed and related to aspects of professional reasoning (VP = viewpoint)

VP	Highly rated		Poorly rated	
	Statements	Aspects of reasoning	Statements	Aspects of reasoning
1	<ul style="list-style-type: none"> <li>• interactive reasoning</li> <li>• community reinsertion</li> <li>• roles of the client</li> </ul>	Narrative, conditional and interactive reasoning	<ul style="list-style-type: none"> <li>• frames of reference</li> <li>• main diagnosis</li> <li>• illness</li> </ul>	Scientific and procedural reasoning
2	<ul style="list-style-type: none"> <li>• ethical reasoning</li> <li>• cooperative learning</li> <li>• academic education</li> </ul>	Ethical and scientific reasoning	<ul style="list-style-type: none"> <li>• images of people with disabilities</li> <li>• contact with people with disabilities</li> <li>• main problem of the client</li> </ul>	Interactive and narrative reasoning
3	<ul style="list-style-type: none"> <li>• assessments of the client</li> <li>• intervention planning</li> <li>• functionality of the client</li> </ul>	Pragmatic reasoning	<ul style="list-style-type: none"> <li>• referents in own learning</li> <li>• mentor</li> </ul>	Related to highly pragmatic reasoning
4	(Not clearly identified)	-	<ul style="list-style-type: none"> <li>• specific vocabulary and terminology</li> <li>• models of practise</li> <li>• frame of reference</li> </ul>	Procedural reasoning

purely specific to the occupational therapy process. One of the reasons for this could be students' early encounter with such pragmatic reasoning.

The appearance of this mode of reasoning tends to be more appropriate towards the end of the course, when there has already been adequate development with respect to basic narrative, interactive and procedural skills [17]. Centring oneself on aspects that are individual or specific could have long-term repercussions, such as a low level of theoretical justification or a lack of regard for significant aspects of the person's occupational narrative. Because of this, we can conclude that some acquisitional models of professional reasoning skills do not match the previous evidence because last-year students were not included in the study. This situation provides an opportunity to ask whether these personal biases may be related to different cognitive processes, assumptions or temporary event preferences.

It remains necessary to examine these perspectives more deeply, to make new comparisons of viewpoints and to look more closely at each of the components of the various personal variables. Setting each subjective point as an aspect of reasoning to a greater or lesser extent allows us to assess the evolution of a student's thoughts, to know whether he or she has examined important aspects sufficiently deeply and to assess his or her scientific knowledge and the specificity of interventions in the field of occupational therapy. Finally, designing training programmes based on this evidence could improve the quality of the various professionals in the discipline. Knowledge of students' perceptions can facilitate the organisation of new educational programmes and subjects, the promotion of different types of reasoning, the prioritisation of clinical aspects vs. theoretical aspects, and the exploration of the differences between an experiential approach and an academic approach. All of this can improve the quality of undergraduates, making their reasoning more proximate to that of practitioners and even closing the gap between novices and experts.

### Limitations of the study

This study explored the perspectives and viewpoints on professional reasoning held by occupational therapy undergraduates in Spain. The findings may not be applicable to people with different backgrounds. This is inherent in the aim of a Q-study, which is to explore patterns of subjectivity. The Q-methodology is not intended to develop general knowledge about a population. Our study considers the topic of reasoning from a new dimension to support students' academic training based on a methodology that has not been explored in this area to date.

### Conclusions

Through the application of Q-methodology, this study identified the perceptions held by the students of the study group concerning the different variables that

interact in their training and in the development of professional reasoning in occupational therapy. The perceptions observed could be linked to the various aspects of professional reasoning that have been widely discussed in the occupational therapy literature. There is a strong correspondence between the narrative, interactive and conditional aspects of the various components in a majority of the students. These components reflect the prioritisation of a practice centred on clients' requirements, their life experience and their future.

It is necessary to examine this topic more deeply with comparisons between courses and study programmes at different universities and other variables that could help create or modify educational policies intended to improve students' training and to prioritise those constructs that are less highly rated in these perceptions but are still important in practice. It also seems necessary to use innovative assessments of student learning such as Q-sort, to understand learners' perspectives and experiences. Professional reasoning is key for the development of an intervention plan and a quality practice that is reflected in the care accorded to the client. This understanding supports its acquisition during university studies, enabling the development of professionals who are better qualified for clinical and research practice.

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### Authors' contributions

UMA conceived and designed the research, collected, and analysed data and wrote draft manuscript. LJA analysed data results and contributed to the preparation of the manuscript. UMA, MA1V and PMM participated in developing the Q-set from libraries and archives and facilitated the triangulation of the data. AISG and JICA analysed data and contributed to the preparation of the manuscript. All authors read and approved the final manuscript.

### Funding

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### Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

### Declarations

#### Ethics approval and consent to participate

This study was undertaken with the authorisation of the Asturias Research Ethics Committee (no. 2020.532) and in accordance with the ethical guidelines of the Declaration of Helsinki and of Organic Law 3/2018, of 5 December 2018, on the protection of personal data and the guarantee of digital rights. All the students participated in the study voluntarily and signed an informed consent form.

#### Consent for publication

Not applicable.

#### Competing interests

The authors declare that they have no competing interests.

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## References

- Schell BA, Schell JW. Professional reasoning as the basis of practice. In: Schell BA, Schell JW, editors. *Clinical and professional reasoning in occupational therapy*. Philadelphia: Lippincott Williams and Wilkins; 2008.
- Schell BA, Gillen G, Scaffa M. Glossary. In: Schell BA, Gillen G, Scaffa M, editors. *Willard and Spackman's occupational therapy*. 12th ed. Philadelphia: Lippincott Williams and Wilkins; 2014.
- Talavera-Valverde MA. Estudio del razonamiento clínico en estudiantes de terapia ocupacional. A Coruña: Universidade A Coruña; 2015.
- Unsworth C, Baker A. A systematic review of professional reasoning literature in occupational therapy. *Br J Occup Ther*. 2016;79(1):5–16. <https://doi.org/10.1177/0308022615599994>.
- Hocking C, Ness NE. Minimum standards for the education of occupational therapists. *Forrestfield: World Federation of Occupational Therapists*; 2002.
- Scanlan JN, Hancock N. Online discussions develop students' clinical reasoning skills during fieldwork. *Aust Occup Ther J*. 2010 Dec;57(6):401–8. <https://doi.org/10.1111/j.1440-1630.2010.00883.x>.
- Coates GL, Crist PA. Brief or new: professional development of fieldwork students: occupational adaptation, clinical reasoning, and client-centeredness. *Occup Ther Health Care*. 2004;18(1–2):39–47. [https://doi.org/10.1080/003v18n01\\_05](https://doi.org/10.1080/003v18n01_05).
- Sladyk K, Sheckley B. Clinical reasoning and reflective practice: implications of fieldwork activities. *Occup Ther Health Care*. 2001;13(1):11–22. [https://doi.org/10.1080/J003v13n01\\_02](https://doi.org/10.1080/J003v13n01_02).
- Márquez-Álvarez LJ, Calvo-Arenillas JI, Talavera-Valverde MÁ, Moruno-Millares P. Professional reasoning in occupational therapy: a scoping review. *Occup Ther Int*. 2019;2019:6238245.
- Neistadt ME. Classroom as clinic: a model for teaching clinical reasoning in occupational therapy education. *Am J Occup Ther*. 1987 Oct;41(10):631–7. <https://doi.org/10.5014/ajot.41.10.631>.
- Neistadt ME. Teaching strategies for the development of clinical reasoning. *Am J Occup Ther*. 1996 Sep;50(8):676–84. <https://doi.org/10.5014/ajot.50.8.676>.
- Neistadt ME. Teaching clinical reasoning as a thinking frame. *Am J Occup Ther*. 1998 Mar;52(3):221–9. <https://doi.org/10.5014/ajot.52.3.221>.
- Neistadt ME, Wight J, Mulligan SE. Clinical reasoning case studies as teaching tools. *Am J Occup Ther*. 1998 Feb;52(2):125–32. <https://doi.org/10.5014/ajot.52.2.125>.
- Gruppen LD. Clinical reasoning: defining it, teaching it, assessing it, Studying It. *West J Emerg Med*. 2017;18(1):4–7. <https://doi.org/10.5811/westjem.2016.11.33191>.
- Patton N, Christensen N. Pedagogies for teaching and learning clinical reasoning. In: Higgs J, Jensen G, Loftus S, Christensen N, editors. *Clinical reasoning in the health professions*, 4th edition. Elsevier; 2019.
- Blumberg P. Maximizing learning through course alignment and experience with different types of knowledge. *Innov High Educ*. 2009;34(2):93–103. <https://doi.org/10.1007/s10755-009-9095-2>.
- Dutton R. *Clinical reasoning in physical disabilities*. Baltimore: Williams & Wilkins; 1995.
- Pitonyak JS, Nielsen S, O'Brien SP, Corsilles-Sy C, Lambert DO, Jaffe LE. Critical thinking in occupational therapy education: a systematic mapping review. *J Occup Ther Educ*. 2020;4(4):1–28.
- Moruno-Miralles P, Reyes-Iorres A, Talavera-Valverde MÁ, Souto-Gómez AI, Márquez-Álvarez LJ. Learning and development of diagnostic reasoning in occupational therapy undergraduate students. *Occup Ther Int*. 2020;2020:6934579.
- Schuwirth LWT, Durning SJ, Norman GR, van Der Vleuten CPM. Assessing clinical Reasoning. In: Higgs J, Jensen G, Loftus S, Christensen N, editors. *Clinical reasoning in the health professions*, 4th edition. Elsevier; 2019.
- Nicola-Richmond KM, Pépin G, Larkin H. Transformation from student to occupational therapist: using the Delphi technique to identify the threshold concepts of occupational therapy. *Aust Occup Ther J*. 2016 Apr;63(2):95–104. <https://doi.org/10.1111/1440-1630.12252>.
- Price P, Hooper B, Krishnagiri S, Taff SD, Bilics A. A Way of Seeing: How Occupation Is Portrayed to Students When Taught as a Concept Beyond Its Use in Therapy. *Am J Occup Ther*. 2017;71(4):7104230010p1–9.
- Kaelin VC, Dancza K. Perceptions of occupational therapy threshold concepts by students in role-emerging placements in schools: a qualitative investigation. *Aust Occup Ther J*. 2019 Dec;66(6):711–9. <https://doi.org/10.1111/1440-1630.12610>.
- Fortune T, Kennedy-Jones M. Occupation and its relationship with health and wellbeing: the threshold concept for occupational therapy. *Aust Occup Ther J*. 2014 Oct;61(5):293–8. <https://doi.org/10.1111/1440-1630.12144>.
- Robertson D, Warrender F, Barnard S. The critical occupational therapy practitioner: how to define expertise? *Aust Occup Ther J*. 2015 Feb;62(1):68–71. <https://doi.org/10.1111/1440-1630.12157>.
- Dieruf K. Ethical decision-making by students in physical and occupational therapy. *J Allied Health*. 2004 Spring;33(1):24–30.
- Hagedorn R. Clinical decision making in familiar cases: a model of the process and implications for practice. *Br J Occup Ther*. 1996;59(5):217–22. <https://doi.org/10.1177/030802269605900508>.
- Brown SR. A primer on Q methodology. *Operant Subjectivity*. 1993;16(3/4):91–138.
- Smith N. *Current systems in psychology: history, theory, research and application*. Belmont: Wadsworth / Thomson Learning; 2001.
- Brown SR. Q methodology and qualitative research. *Qual Health Res*. 1996; 6(4):561–7. <https://doi.org/10.1177/104973239600600408>.
- Alderson S, Foy R, Bryant L, Ahmed S, House A. Using Q-methodology to guide the implementation of new healthcare policies. *BMJ Qual Saf*. 2018 Sep;27(9):737–42. <https://doi.org/10.1136/bmjqs-2017-007380>.
- Tiemon P, Hensel D, Roy-Ehri L. Using Q methodology in quality improvement projects. *J Obstet Gynecol Neonatal Nurs*. 2017 Jul-Aug;46(4): 601–8. <https://doi.org/10.1016/j.jogn.2017.04.133>.
- Garbellini S, Randall M, Steele M, Elliott C, Imms C. Unpacking the application of Q methodology for use in occupational therapy research. *Scand J Occup Ther*. 2020 Jan:1–6. <https://doi.org/10.1080/11038128.2019.1709542>.
- Hutton B, Catalá-López F, Moher D. La extensión de la declaración PRISMA para revisiones sistemáticas que incorporan metaanálisis en red: PRISMA-NMA. *Med Clin (Barc)*. 2016 Sep 16;147(6):262–6. <https://doi.org/10.1016/j.medcli.2016.02.025>.
- Watts S, Stenner P. Doing Q methodology: theory, method and interpretation. *Qual Res Psychol*. 2005;2(1):67–91. <https://doi.org/10.1191/1478088705qp022oa>.
- Brown SR. Q methodology. In: Given LM, editor. *The SAGE encyclopedia of qualitative research methods*. Thousand Oaks: Sage; 2008.
- Chee DY, Lee HC, Patomella AH, Falkmer T. Driving behaviour profile of drivers with autism spectrum disorder (ASD). *J Autism Dev Disord*. 2017 Sep;47(9):2658–70. <https://doi.org/10.1007/s10803-017-3178-1>.
- Thompson M, Elliott C, Willis C, Ward R, Falkmer M, Falkmer T, et al. Can, want and try: Parents' viewpoints regarding the participation of their child with an acquired brain injury. *PLoS One*. 2016 Jul 1;11(7):e0157951. <https://doi.org/10.1371/journal.pone.0157951>.
- Garbellini S, Randall M, Steele M, Elliott C, Imms C. Prescribing upper limb orthoses for children with cerebral palsy: a Q methodology study of occupational therapists' decision making. *Disabil Rehabil*. 2020 Sep;42(18): 2600–10. <https://doi.org/10.1080/09638288.2019.1573931>.
- Cao R, Stone TE, Petrini MA, Turale S. Nurses' perceptions of health beliefs and impact on teaching and practice: a Q-sort study. *Int Nurs Rev*. 2018 Mar;65(1):131–44. <https://doi.org/10.1111/inr.12399>.
- Kim YS, Kim BH. Study on nursing college students' subjectivity in their attitude toward jobs. *Taehan Kanho Hakhoe Chi*. 2005 Jun;35(4):680–5. <https://doi.org/10.4040/jkan.2005.35.4.680>.
- Baptiste S. Clinical reasoning: an administrator's view. *Can J Occup Ther*. 1992;59(1):3–5. <https://doi.org/10.1177/000841749205900101>.
- Neistadt ME. The classroom as clinic applications for a method of teaching clinical reasoning. *Am J Occup Ther*. 1992 Sep;46(9):814–9. <https://doi.org/10.5014/ajot.46.9.814>.
- Schell BA, Schell JW. *Clinical and professional reasoning in occupational therapy*. 2nd ed. Philadelphia: Lippincott Williams and Wilkins; 2017.
- Chapparo C. Working out: Working with Angelica-Interpreting practice. In: Ryan SE, EA MK, editors. *Thinking and reasoning in therapy: Narratives from practice*. Nelson Thornes; 1999.
- Schell BA, Cervero RM. Clinical reasoning in occupational therapy: an integrative review. *Am J Occup Ther*. 1993 Jul;47(7):605–10. <https://doi.org/10.5014/ajot.47.7.605>.

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### 5.3. Learning and Development of Diagnostic Reasoning in Occupational Therapy Undergraduate Students

#### Research Article

## Learning and Development of Diagnostic Reasoning in Occupational Therapy Undergraduate Students

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*Background/Aim.* One way to facilitate occupational therapy undergraduate students transferring their academic skills of data gathering and analysis to professional settings is to ensure they can competently use diagnostic reasoning. Nevertheless, there are several obvious gaps in empirical evidence related to the learning and development of this style of reasoning in occupational therapy undergraduates. The most important are related to promoting higher-order thinking and the use of information to solve problems in the context of professional practice. This study analyses undergraduates' diagnostic reasoning and its changes during their education. *Materials and Methods.* This multicentre study was conducted with a descriptive observational design. The study took place at the University of Coruña (Spain), University of Castilla-La Mancha (Spain), and University of el Valle (Colombia). The sample was  $n=247$ . For data collection, a clinical case was specifically designed. IBM SPSS Statistics (v19) and EPIDAT 3.1 were used for the data analysis. *Results.* Participants identified and categorized occupational performance problems. However, they had difficulties when identifying and categorizing the occupational performance components (specifically, the symptoms and signs of the disease presented in the study case). They presented limitations to analyse and synthesize the information collected to develop an explanation of the occupational problems and their causes. *Conclusions.* Undergraduate students' ability to analyse and synthesize information during data collection is poorly organized, so it makes the problem formulation difficult. This study contributes to the knowledge of undergraduates' diagnostic reasoning features, specifically the undergraduate students' capacities and limits to process information during the occupational assessment.

### 1. Introduction

Encouraged by the studies on diagnostic reasoning done by the discipline of medicine since the early 1980s, the study of professional reasoning in occupational therapy has led to several lines of research [1]. One of the most important lines is the study of the information processing involved in diag-

nostic reasoning understood as a process of problem solving or decision making [2–7]. This area of research has provided ways to look at the competencies that occupational therapists need to handle information and arrive at an occupational therapy diagnosis in different practice fields [8–12].

Diagnostic reasoning examines and analyses cause(s) or nature of conditions requiring occupational therapy

intervention and attempts to explain why a client is experiencing problems using a blend of scientific-based and client-based information [13]. When diagnostic reasoning is not well constructed, the causes of performance deficits could be misidentified, which could lead to the incorrect intervention principles being followed and thus lead to ineffective treatment [14].

According to Rogers and Holm [6], the problem-solving process that leads to the occupational therapy diagnosis is referred to as diagnostic reasoning. The occupational diagnosis usually consists of components: descriptive, explanatory, cue, and pathologic [6] (Table 1).

Thus, the occupational therapy diagnosis is the product of diagnostic reasoning, the result of the problem-solving process during the initial assessment.

The information processing involved in diagnostic reasoning [10, 15, 16] implies two processes. The first is to acquire cues and recognise patterns during data collection to identify information on occupational performance areas, symptoms and signs, skills, performance patterns, and characteristics of the environment (hereafter, components of performance). This information is categorized thanks to a preselected theoretical framework of reference. The second is to formulate the problem, which allows analysing and synthesizing the information collected in an occupational therapy diagnosis to develop an explanation of the occupational problems and their causes. In this process, not only do experienced occupational therapists have a great deal more knowledge than novices but also their knowledge is more diverse, better organized, and in a more accessible way due to related prior experience [17]. Robertson [18] and Robertson et al. [19] looked at differences between novices and experts in occupational therapists' professional reasoning and found that undergraduate students and experts had access to the same information. However, the information was more clearly defined and highly organized by the experts who develop knowledge networks that are reinforced by working with similar cases over time. This repetition is essential for the development of useful knowledge networks and cannot be replicated by exercises in academic environments.

In the case of undergraduate students, the information was less defined than in the case of the experts due to the lack to domain-specific knowledge related to problem representation. Accordingly, the way in which the novices organize their knowledge to analyse and synthesize the information gathered during the initial assessment is an element of primary importance to acquire a proper professional reasoning during their academic education.

In occupational therapy, the line of research that focuses on the study of the differences between novices vs. experts in professional reasoning has been extensive [1, 20, 21]. However, there are several obvious gaps in empirical evidence, "but ones of such importance that they bear highlighting" are those related to information processing, fieldwork supervision, and personal variances in reasoning [22]. Particularly, those related to the learning and development of diagnostic reasoning of undergraduate students of occupational therapy (no specific references in the literature have been found for

TABLE 1: Structural components of occupational therapy diagnosis [6].

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*Descriptive component:*

Describes the deficit in occupational status. This component reflects a problem in task performance.

For example: "unable to implement the directions on the package in order to bake a frozen potpie."

*Explanatory component:*

This indicates the therapist's hypothesis about the probable cause of the performance problems. The explanatory component is a critical feature of the occupational diagnosis because intervention strategies vary according to presumed explanatory factors.

For example: the therapist might reason that short-term memory deficit accounts for the problem in meal preparation (more than one explanation may be given for the task dysfunction).

*Cues:*

Identifies the cues that led the therapist to conclude that there was a functional deficit and to hypothesize about the nature of the deficit.

For example: signs and symptoms or cues gathered during a meal preparation task indicative of short-term memory deficit might include "reads oven temperature setting aloud three times, but does not locate the oven dial or set the temperature."

*Pathologic:*

Identifies the pathologic agent causing the deficit. It provides intervention parameters based on the course of the pathology, prognosis, and contraindications and guidelines for occupational performance.

For example: short-term memory deficit was a consequence of depression rather than of head trauma or presenile dementia, then problem resolution would differ.

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this topic). According to Farber and Koenig [23] for the future of the profession, "we need to strive toward facilitating the students' best clinical reasoning and to promote relevant problem-solving strategies." As a result, to know the characteristics of the undergraduates' diagnostic reasoning is a prime objective.

From our point of view, although the body of knowledge on clinical reasoning in OT is extensive, it is still inadequate [24]. According with Schaaf [25], Rochmawati and Wiechula [26], and Bondoc [27], educators should start examining their practices and aligning those practices with the best evidence concerning instructional methods. We consider that this purpose fully justifies this research. The overall objective of this study is to analyse undergraduates' diagnostic reasoning and its changes during their education. The specific objectives are (a) to analyse the undergraduates' ability in identifying and categorizing information during data collection, (b) to analyse the undergraduates' ability in analysing and synthesizing information for problem formulation, and (c) to analyse the changes done during the undergraduates' education.

## 2. Materials and Methods

*2.1. Ethics.* The study obtained the approval of the University of Valle Human Ethics Review Institutional Committee

(ethics approval number VRI/1772); the Galician Network of Research Ethics Committees, attached to the General Technical Secretariat of the Department of Health (ethics approval number 2014/399); and the Healthcare Service of Castilla-La Mancha Clinical Research Ethics Committee (ethics approval number 2014/036).

**2.2. Study Design.** Multicentre study [28] was conducted in five phases (from October 2013 to September 2016) and involved three universities: the University of Coruña (Spain) (UDC), University of Castilla-La Mancha (Spain) (UCLM), and University of el Valle (Colombia) (UV). This study falls within the field of educational research [29]. It was conducted with a quantitative approach and a cross-sectional study design [28] (Figure 1).

**2.3. Participants.** After reviewing the bibliography, designing the study, getting approval by the Research Ethics Committees, and obtaining the authorization from the dean of each faculty (Figure 1, phase 1), the process to select the participants started. A meeting was organized with the undergraduates in three different programs: 53 students attended at the Universidad del Valle, 90 at the Universidad de A Coruña, and 104 at the Universidad de Castilla-La Mancha, in which research goals were explained and their voluntary participation in the study was requested. Those who agreed to participate signed informed consent (IC) forms. The universities' population of the three universities in the first, third, and fourth years was 460 undergraduates, with a female predominance  $n = 392$  (85.2%).

Programs length is four years. Content and teaching strategies in the three universities are similar and ordered in the same way. The curricula in all institutions comply with standards from ENOTHE and WOFT [30], and their teacher continuing education criterion and teaching strategies are common and shared by the three universities. Professional reasoning is taught using lectures, reading, problem-based learning, tutorials, and case methods. These strategies are used in specific practice fields: mental health, geriatrics, paediatrics, physical and intellectual impairments, community, and education. The three institutions were actively engaged in the study. The principal researchers are professors from all three institutions, and participants were included from **all** university programs.

In the selection process, first-, third-, and fourth-year undergraduates were included. The second-year undergraduates were not selected because the contents of the syllabus from the first and second years are similar concerning professional reasoning skill learning. With the aim of contextualizing the findings of this study, the structure of occupational therapy programs is described as follows. Therefore, it will be possible to identify when the different elements of professional reasoning are taught and the students' level of expertise. The students acquire generic competencies associated with basic general knowledge of professional reasoning during the two first years of education, at the three universities (Table 2).

The basic assumption was that the undergraduate students will improve their ability to identify, categorize, analyse, and synthesize the information during their education. Those who were also enrolled in a related degree and those who were retaking subjects from previous academic years were excluded. Finally, after doing the pilot test and after excluding those undergraduates that voluntarily decided not to participate, the study sample was  $n = 247$  participants, with an average age of  $21 \pm 1.5$  and a female prevalence of  $n = 222$  (89.9%) (Figure 1, phase 2).

**2.4. Data Collection.** For data collection, a clinical reasoning case study was specifically designed [28] which consisted of a description of the gathered data, step by step, during the initial evaluation process. According to Neistadt et al. [31], a clinical reasoning case study is a type of case method that "illustrate the occupational therapist's thought processes by providing specific client information." This type of case study chunks client information the way an experienced therapist might. Therefore, a case study method is reliable to assess professional reasoning to the extent that it "uses a variety of reasoning skills critical to solving real clinical problems" [32].

This case study was validated during two years with a group of occupational therapists ( $n = 150$ ) who had more than five years of experience in different fields of practice, with a reliability coefficient of 0.98 ( $r_{xx'} = 0.98$ ). Furthermore, it was conducted as a pilot study with students from two universities (UDC and UCLM). In this pilot study, we had 149 students from the first, second, third, and fourth academic years. The validity in the pilot study with the student's population achieved a reliability coefficient of 0.80 ( $r_{xx'} = 0.80$ ) [28] (Figure 1, phase 2). The questions were formulated after reviewing the literature on similar studies [33]. All the questions at the end of the Figure 2 were checked by three experts (from each university), to make them easier to understand for the students. This consultation resulted in a further modification of the information contained in the case. So, it was culturally more valid for students at Universidad del Valle (Colombia). Finally, five open questions were developed for each participant to answer (Figure 2).

According to the previous questions, the participants were requested (a) to read the case in order to identify and categorize the occupational performance problems, (b) to identify and categorize the components of performance associated with the identified occupational performance problems, and (c) to formulate the problem, according to an occupational therapy diagnosis. Open questions were used to obtain the data related with the study variables, basing on the analysis of the student's answers, as described in Table 3. Each participant received the same instructions before solving the case. The test was conducted in a single room, which was large enough to keep participants working individually in small groups of five undergraduate students. After presenting the study, the authors distributed the booklets to the participants. The participants worked with the same booklet throughout the test. Time and progress throughout the sequence of

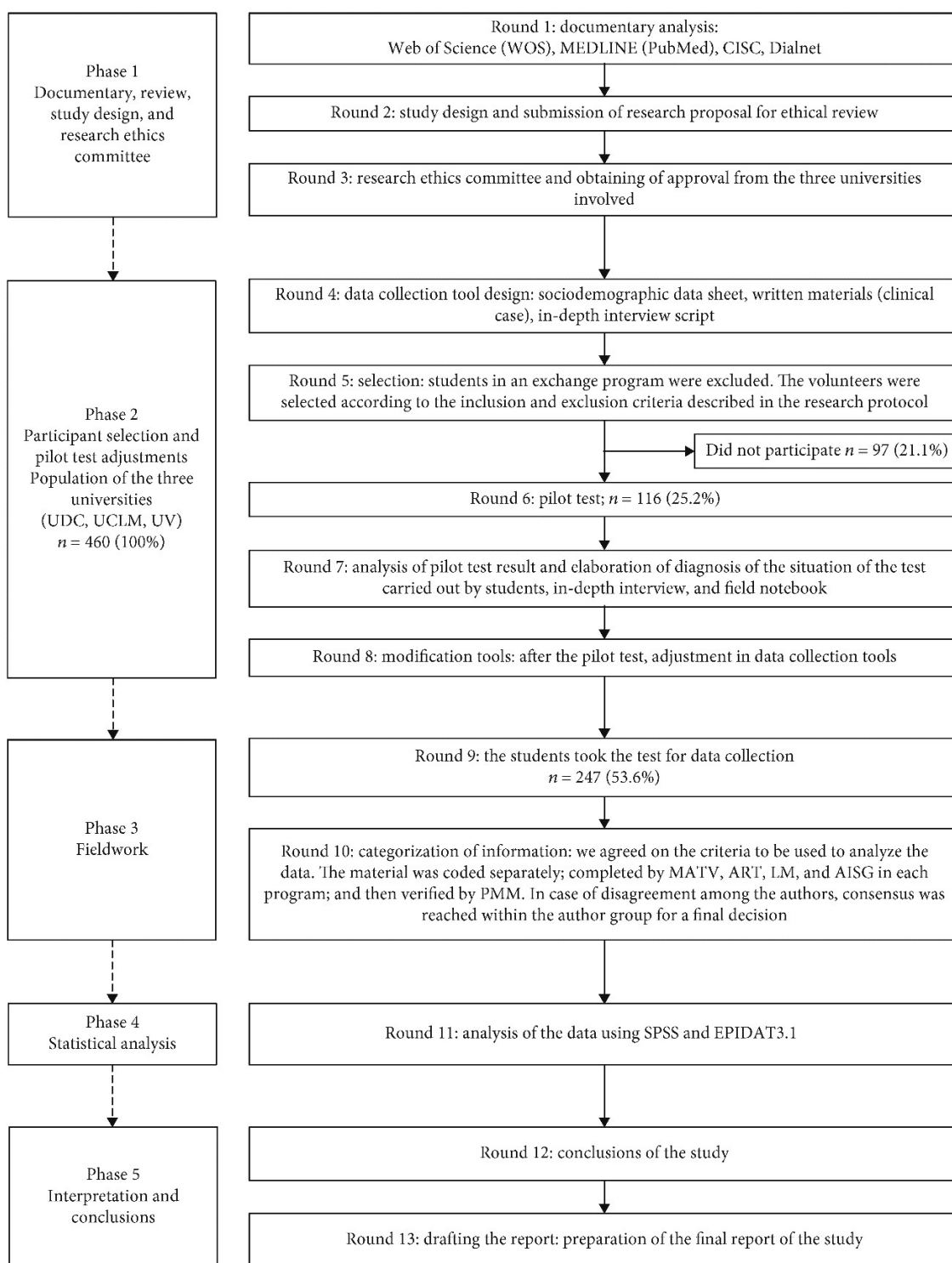


FIGURE 1: Flow chart of research stages and participants in the study.

steps were controlled. The case resolution time was about 60 minutes.

2.5. *Data Analysis.* The established variables for the assessment of the undergraduates' answers about the case resolution are found in Table 3.

A descriptive study of the variables registered in the study was carried out. The variables were expressed by measures of frequency and percentage. The chi-square test was used to test the null hypothesis of equality of proportions, with a confidence interval of 95%. The analysis was carried out using IBM SPSS Statistics (v19) and EPIDAT 3.1.



TABLE 2: The clusters of specific competences associated with occupational therapy process and professional reasoning at the different universities.

					f <sup>1</sup> /2 <sup>nd</sup>	uv 3 <sup>rd</sup>	4 <sup>th</sup>
TFound, model, and MB	<b>X</b>			<b>X</b>	<b>X</b>		
PD and PF		<b>X</b>		<b>X</b>		<b>X</b>	<b>X</b>
Community and other fields			<b>X</b>		<b>X</b>	<b>X</b>	<b>X</b>
Mental health and geriatrics		<b>X</b>		<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>

PD and PF: physical dysfunction and paediatric fields; TFound, model, and MD: theoretical foundations, models of practice, and methodological bases.

Performance problems	Performance components
PP1. <i>"He has stopped going to the bank and he doesn't take care of the households' expenses. He a/so has stopped driving. He doesn't clean nor iron his clothes; he stopped taking out the trash and he doesn't clean his kitchen."</i>	PC2 Performance skills: <i>"he doesn't know how to cook. He doesn't know how to do his housework because he has never done that. His wife took care of the house when she was alive."</i> PC4 Environment: <i>"since the death of his wife, he must take care of his house and he also must elaborate his meals. In addition, he is reticent to do his housework. He thinks that these are tasks for women."</i> PCI Symptoms/signs: <i>"decreased energy (feeling 'slowed down') and anxiety."</i>
PP2. <i>"He has abandoned the activities he did in the past with his grandsons."</i>	PC4 Environment: <i>"his daughters have moved to another house in the last month."</i> PC3 Performance patterns: <i>"he stopped going to his daughter's house because he was taking care of his wife, during her illness (18 manths)."</i>
PP3. <i>"He has stopped reading when he is going to sleep, so now it's more difficult for him to fall asleep."</i>	PCI Symptoms/signs: <i>decreased energy (feeling 'slowed down').</i> PCI Symptoms/signs: <i>"persistent sad, feelings of hopelessness, and obsessive thoughts."</i> PC3 Performance patterns: <i>"he spends a lot of hours in front of the television at night. he feels that his bedroom is dirty, so it's more difficult for him to fall asleep."</i>
PP4. <i>"He has stopped going to the cinema, walking, and going out to have dinner, since the death of his wife."</i>	JJC4 PC3 Performance patterns: <i>"he hardly leaves his house. He has lost his habits and routines. He spends a lot of hours in front of the television."</i> PC4 Environment: <i>"death of his wife 6 months ago. Since she died, he has lost the social relations with his close friends."</i> PCI Symptoms/signs: <i>"decreased energy (feeling 'slowed down')."</i>
Questions	
<ol style="list-style-type: none"> <li>1. Could you identify the performance problems in occupational areas (instrumental activities of daily living, social participation, sleep, and rest and leisure) that this person has? Please categorize each performance problem identified in one performance area.</li> <li>2. Could you identify the performance components related to these performance problems? Please categorise each performance component according to symptoms/signs, performance skills, performance patterns, and environment.</li> <li>3. Could you analyse the information identified to connect performance problems with their hypothetical causes?</li> <li>4. Could you summarize the whole information gathered in an occupational diagnosis?</li> <li>5. Do you think that this occupational diagnosis is accurate?</li> </ol>	

PP: Performance Problem; PC: Performance components; PP1. Instrumental Activities of Daily Living (IADL); PP2. Social Participation; PP3. Sleep and Rest; PP4. Leisure.

FIGURE 2: Case study. PP: performance problem; PC: performance components; PP1: instrumental activities of daily living (IADL); PP2: social participation; PP3: sleep and rest; PP4: leisure.

TABLE 3: Data analysis.

To evaluate the undergraduates' knowledge related to identification and categorization of performance problems (PP), the established variables were:		
<i>Variables</i>	<i>Identification</i>	<i>Categorization</i>
PP1: IADL	One point per variable when students were able to identify each occupational problem presented.	One point per variable when students describe the specific activity related with the identified problem and name it properly in the corresponding performance area.
PP2: social participation		
PP3: sleep and rest		
PP4: leisure		
To evaluate the undergraduates' knowledge related to identification and categorization of performance components (PC), the established variables were:		
<i>Variables</i>	<i>Identification</i>	<i>Categorization</i>
PC1: symptoms/signs	One point per variable when students were able to identify the performance components related with the performance problem.	One point per variable when students correctly name the performance components identified.
PC2: performance skills		
PC3: performance patterns		
PC4: environment		
To evaluate the knowledge organization of the undergraduates of analysing information (AI), the established variables were:		
<i>Variables</i>	(0) For those undergraduates that were not able to associate any variable with the identified performance problems.	
AI1: symptoms/signs	(1) For those undergraduates that associated just one variable presented in the case with the identified performance problems.	
AI2: performance skills	(2) For those undergraduates that were able to associate two or more variables presented in the case with the identified performance problems.	
AI3: performance patterns		
AI4: environment		
To evaluate the knowledge organization of the undergraduates in synthesizing information, the established variables were:		
<i>Complete occupational diagnosis</i>	<i>Partial occupational diagnosis</i>	
Students were given one point for a complete diagnosis when the undergraduate identified the 4 problems in the occupational performance and was able to associate them with $\geq 2$ performance components.	Students were given one point for a partial occupational diagnosis when the undergraduate described at least $\geq 1$ occupational problem and was able to associate them with at least $\geq 1$ performance component.	

### 3. Results

The percentage of participants that identified and categorized information related to performance components was significantly lower than the percentage of participants that identified and categorized occupational performance problems. It should be noted that the lowest percentage was symptoms and signs (Table 4).

Regarding the knowledge organization of the undergraduates for analysing and synthesizing information for problem formulation, most participants in the study did not associate any symptoms or signs as a probable cause of performance problems. Only 4.9% of the participants associated one symptom or sign, and only three participants in their fourth year associated two or more symptoms or signs. In addition, the percentage of participants that associated only one component of performance as a probable cause of performance problems was higher than the percentage of participants that associated two or more components of performance. In short, the ability of students to analyse information was poor (Table 5).

In relation to synthesizing information in an occupational therapy diagnosis, the results show that none of the undergraduate students made a complete occupational diagnosis. Nevertheless, less than half of the participants made a partial occupational diagnosis. In this partial diagnosis, 16% identified only one variable to explain the performance problems described whereas 27% identified two

or more variables (three variables were expected for a totally correct response). In summary, students showed very low percentages of occupational therapy diagnosis.

Regarding the changes during the undergraduates' education, there was a significant increase in the identification of performance problems in the IADL and social participation areas ( $p = 0.005$ ) between academic years (hereafter, AY) 1 and 4. The increase in the identification of occupational performance problems in the leisure area was constant throughout academic education ( $p = 0.001$ ). The comparison of the other academic years did not reveal any significant differences. With respect to the development in categorization of the identified performance problems, when AY1 vs. AY4 and AY3 vs. AY4 are compared, a significant increase in all the occupational performance areas can be identified (Table 6).

An increase in the identification of the performance components was also identified, specifically in the signs and symptoms, in the performance patterns, and in the environment ( $p = 0.001$ ) when comparing the first and fourth academic years. Also, when the first and third academic years were compared, a significant increase in the categorization of the performance components was identified, specifically in the signs and symptoms ( $p = 0.004$ ) and in the performance patterns ( $p = 0.001$ ) (Table 6).

In summary, a significant improvement was identified in the identification and categorization of information into

TABLE 4: Results regarding identifying and categorizing information<sup>1</sup>.

	Performance problems and performance components	
	<i>n</i> (%)	CI (95%)
<i>Identification of occupational performance problems</i>		
PP1: instrumental activities of daily living	206 (83.4)	78.6-88.2
PP2: social participation	206 (83.4)	78.6-88.2
PP3: rest and sleep	195 (78.9)	73.7-84.2
PP4: leisure	85 (34.4)	28.3-40.5
<i>Identification of occupational performance components</i>		
PC1: symptoms/signs	15 ( <b>6.1</b> )	2.9-9.3
PC2: performance skills	56 (22.7)	17.2-28.1
PC3: performance pattern	41 (16.6)	11.8-21.4
PC4: environment	79 (32)	8.6-17.3
<i>Categorization of performance problems</i>		
PP1: instrumental activities of daily living	72 (29.1)	23.3-35
PP2: social participation	31 (12.6)	8.2-16.9
PP3: rest and sleep	121 (49.1)	42.6-55.4
PP4: leisure	40 (16.2)	11.4-21
<i>Categorization of components of occupational performance</i>		
PC1: symptoms/signs	37 (15)	10.3-19.6
PC2: performance skills	56 (22.7)	17.2-28.1
PC3: performance pattern	42 (17)	12.1-21.9
PC4: environment	90 (36.4)	30.2-42.6

\*Results for the group of participants from the three universities (UV, UDC, and UCLM). Percentages are based on the total sample ( $n = 247$ ). CI: confidence interval; PP: performance problem; PC: occupational performance components.

TABLE 5: Results regarding analysing information\*.

		Problem formulation: analysing information			<i>p</i> value*	Total <i>n</i> (%)
		AY1 ( <i>n</i> = 96) <i>n</i> (%)	AY3 ( <i>n</i> = 85) <i>n</i> (%)	AY4 ( <i>n</i> = 66) <i>n</i> (%)		
All: symptoms/signs	<b>0</b>	96 (38.9)	83 (33.6)	53 (21.5)	<b>0.001</b>	232 (93.9)
		0 (0)	2 (0.8)	10 (4)		12 (4.9)
	2:2	0 (0)	0 (0)	3 (1.2)		3 (1.2)
AI2: performance skills	<b>0</b>	80 (32.4)	64 (25.9)	47 (19)	0.168	191 (77.3)
	1	14 (5.7)	20 (8.1)	15 (6.1)		49 (19.8)
	::>2	2 (0.8)	1 (0.4)	4 (1.6)		7 (2.8)
AI3: performance patterns	<b>0</b>	95 (38.5)	67 (27.1)	40 (16.2)	<b>0.001</b>	202 (81.8)
	J	0 (0)	16 (6.5)	16 (6.5)		33 (13.4)
	::>2	0 (0)	2 (0.8)	6 (2.4)		8 (3.2)
AI4: environment	<b>0</b>	77 (31.2)	56 (22.7)	31 (12.6)	<b>0.004</b>	164 (66.4)
	1	16 (6.5)	16 (6.5)	16 (6.5)		48 (19.4)
	::>2	3 (1.2)	13 (5.3)	15 (6.1)		31 (12.6)

\*Results for the group of participants from the three universities (UV, UDC, and UCLM). AY: academic year. Percentages are based on the total sample ( $n = 247$ ). \*Statistically significant variables ( $p < 0.005$ ) are highlighted in italics.

TABLE 6: Comparison of differences among academic years: identification and categorization of problems/components of occupational performance\*.

	Performance problems and performance components					
	AY1 ( <i>n</i> = 96) <i>n</i> (%)	AY3 ( <i>n</i> = 85) <i>n</i> (%)	AY4 ( <i>n</i> = 66) <i>n</i> (%)	<i>p</i> value** AY1 vs. AY3	<i>p</i> value** AY1 vs. AY4	<i>p</i> value** AY3 vs. AY4
Identification of occupational performance problems						
PP1: IADL	73 (76)	71 (83.5)	62 (93.9)	0.288	0.005	0.088
PP2: SP	73 (76)	71 (83.5)	62 (93.9)	0.052	0.005	0.088
PP3: RS	73 (76)	66 (77.6)	56 (84.8)	0.937	0.242	0.365
PP4: leisure	1 (1)	28 (32.9)	56 (84.8)	<i>0.001</i>	<i>0.001</i>	<i>0.001</i>
Identification of occupational performance components						
AI1: S/S	0 (0)	2 (0.8)	13 (5.2)	0.424	<i>0.001</i>	<i>0.001</i>
AI2: PS	16 (6.5)	21 (8.5)	19 (7.7)	0.249	0.009	0.706
AI3: PP	1 (0.4)	18 (7.3)	22 (8.9)	<i>0.001</i>	<i>0.001</i>	0.135
AI4: environment	19 (7.7)	29 (11.8)	31 (12.6)	0.044	<i>0.001</i>	0.152
Categorization of performance problems						
PP1: IADL	24 (25)	10 (11.8)	38 (57.6)	0.037	<i>0.001</i>	<i>0.001</i>
PP2: SP	4 (4.2)	6 (7.1)	38 (31.8)	0.600	<i>0.001</i>	<i>0.002</i>
PP3: RS	23 (24)	41 (48.2)	57 (86.4)	0.001	<i>0.001</i>	<i>0.001</i>
PP4: leisure	1 (1)	4 (4.7)	35 (53)	0.295	<i>0.001</i>	<i>0.001</i>
Categorization of components of occupational performance						
AI1: S/S	3 (3.1)	14 (16.5)	20 (30.3)	0.004	0.964	0.068
AI2: PS	16 (16.7)	21 (24.7)	19 (28.8)	0.248	0.099	0.705
AI3: PP	1 (1)	18 (21.2)	23 (34.8)	<i>0.001</i>	<i>0.001</i>	0.091
AI4: environment	19 (19.8)	33 (38.8)	38 (57.6)	0.007	<i>0.001</i>	0.033

Comparison and estimation of differences among academic years in the identification and categorization of each area and components of occupational performance. \*Results for the group of participants from the three universities (UV, UDC, and UCLM). AY: academic year. Percentages are based on the total number of participants in each academic year. S/S: symptoms/signs; PS: performance skills; IADL: instrumental activities of daily living; SP: social participation; RS: rest and sleep; PP: performance patterns. \*\*Statistically significant variables ( $p < 0.005$ ) are highlighted in italics.

performance areas and performance components (symptoms/signs, performance patterns, and environment) throughout the students' academic education.

On the other hand, a statistically significant improvement in analysing information throughout the students' education was found in symptoms/signs and performance patterns ( $p = 0.001$ ) and environment ( $p = 0.004$ ), as well as an improvement in synthesizing information using an occupational therapy diagnosis. The comparison between the academic years AY1 vs. AY4 and AY3 vs. AY4 yielded a chi-square of  $p = 0.001$  (Table 6).

#### 4. Discussions

The results of this research show that participants identified and categorized occupational performance problems. However, they had difficulties when identifying and categorizing the occupational performance components (specifically, the symptoms and signs of the disease presented in the study case). In addition, they showed poor capacity in analysing and synthesizing the information collected to outline the problem formulation. As a result, undergraduate students have difficulty processing the occupational performance components during the initial evaluation to articulate a satis-

factory explanation of the occupational problems presented in the case.

The previous considerations arise from the two findings that were obtained. The first of them is related to the undergraduate's knowledge in identifying and categorizing information during data collection. According to the literature review, undergraduate students of occupational therapy historically have difficulties in identifying and describing problems in occupational performance. However, they do not have those difficulties when it comes to describing medical and psychosocial conditions [3, 6]. Contrary to what might be expected from the literature review [34, 35], a high percentage of the participants in this research were able to identify the information related to the performance areas presented in the case study. However, they found it more difficult to identify the signs, symptoms, skills, patterns, and environmental characteristics related to such performance problems. They also found it difficult to categorize them according to a theoretical reference framework or practice model.

Although various studies [36, 37] emphasize the primacy of psychological and medical models in the education of undergraduates, this finding obtained from the study participants is contrary to that thesis. This fact may be related to (a) the strengthening of practice models in our discipline, which

are focused on the study of performance and occupational participation and which are organized around the evaluation of the areas of occupational performance, and (b) the weakening of education in basic knowledge of medicine and psychology [38].

This interpretation is confirmed when the facility of participants to identify and categorize problems in performance areas is compared with the facility to identify signs, symptoms, skills, patterns, and characteristics of the environment. The latter was significantly lower, particularly in the case of pathological conditions. The percentage of participants who identified the signs and symptoms of the disease presented in the case was minimal. These facts question central aspects of occupational therapy undergraduates' education since it is a health science, and therefore, the knowledge of pathological conditions and their influence on occupational performance and participation are decisive. Strengthening our practice models should not lead to underestimate medical and psychological knowledge because they assist in the elaboration of an occupational therapy diagnosis [39].

In this regard, we advocate for reinforcing the acquisition of knowledge related to medical and psychological conditions and for consolidating the undergraduate students' education to identify and categorize this kind of data collected during the evaluation.

In the second finding, although an improvement of the knowledge organization of the undergraduates for problem formulation is identified, it is found that undergraduate students present limitations in analysing and synthesizing the information collected in order to develop an explanation of the occupational problems.

On the one hand, none of the participants elaborated a complete occupational diagnosis. In addition, although a small number of participants made a partial occupational diagnosis, this is characterized by relating a single variable to explain the identified performance problems. It seems that despite finding improvements in the clinical reasoning of students when they increase their experience and advance in their courses, this improvement is not reflected in their ability to synthesize information collected during the initial assessment. The analysis of more than one variable to explain the causes of performance problems is very low among the participants. There is a predominance of reductive explanations, focusing on performance patterns and skills as the only causes of performance problems at the expense of explanations examining the complex and changing dynamics of factors that affect occupational performance and participation [40]. In other words, they tend to make reductive interpretations of performance problems instead of doing multifactorial interpretations, which would be more aligned with the theoretical assumptions of our discipline.

This study confirms the participants' limitations in organizing their knowledge according to an occupational therapy diagnosis. As they have these difficulties, they rely on other areas of knowledge, such as medicine and psychology to elaborate an occupational therapy diagnosis [37].

Previous research findings emphasize the importance of carrying out a problem formulation, encompassed by an occupational therapy diagnosis [18, 41]. Thus, an occu-

pational therapy diagnosis makes easier to understand the complex and dynamic interaction among symptoms/signs, performance **skills**, performance patterns, and environments, along with the activity demands of the occupation being performed [38]. Therefore, the causes of performance problems can be identified better, leading to the correct intervention principles being followed and thus leading to effective intervention.

The findings of this research show that participants had difficulties to elaborate an occupational therapy diagnosis. This limitation might be related to the reductive interpretation of occupational performance problems. So, interpretation moves away from the ontological exegesis of the performance problems and occupational participation that define our discipline [42].

The participants' interpretation is based fundamentally on medical and psychological variables derived from a health exegesis of individual nature. It is the opposite of other broader interpretations that relate the health of individuals, groups, and communities to environmental, social, and cultural factors. These interpretations argue that the conditions of injustice, deprivation, alienation, imbalance, and occupational apartheid have determinant effects on the capacity for performance and occupational participation of individuals, groups, and communities [43].

The difficulty to elaborate an occupational therapy diagnosis could create a gap in the understanding of the new theoretical contributions in occupational therapy.

We strongly advocate promoting the organization of knowledge brought by occupational therapy diagnosis. Strengthening the undergraduate students' education to reason professionally is the best way to progress our knowledge.

An overview of our results shows a progression in the ability of students to identify, categorize, and analyse case information. When we compared responses between first- and fourth-year students, first- and third-year students, and third- and fourth-year students, we found that the higher the year, the better is their identification of relevant information and the information analysis is more complete and diverse [41]. This finding might be explained by students increasing experience and learning who are developing more knowledge and diverse knowledge. However, results do not show a similar progression in student's ability to elaborate an occupational diagnosis. This last fact might indicate that despite the education received, students have difficulties to synthesize information, because of their difficulties to represent the problem [18, 19, 23]. Probably, this difficulty is related with the fact that the students do not have their knowledge organized well because they do not have prior experience. It would be necessary to strengthen the learning of the occupational therapy diagnosis.

In conclusion, the findings of this research with respect to undergraduate students' knowledge related to the identification and categorization of information, as well as its analysis and synthesis, question the undergraduate's ability to carry out efficient diagnostic reasoning. This fact could lead to the incorrect intervention principles being followed and thus lead to ineffective treatment.

**4.1. Study Limitations.** Due to the characteristics of the research design, it was not possible to establish control procedures for potential confounding variables to avoid potential bias in results. However, the study does make it possible to establish the possible relationship between the variables involved to conduct analytical studies.

**4.2. Future Lines of Research.** Our results suggest reinforcing students' professional reasoning learning by improving theoretical knowledge and practical skills related to problem representation and occupational diagnosis. It should be noted that research on undergraduates' professional reasoning from English-speaking countries predominates. This suggests that this research area in developing countries has not been sufficiently studied. Therefore, further research should be undertaken to analyse in depth the cultural relevance of knowledge involved in the undergraduates' learning process of professional reasoning.

## 5. Conclusions

Undergraduate students' ability to analyse and synthesize information during data collection is poorly organized, so it makes the problem formulation difficult. Although an improvement was observed in the knowledge and its organization throughout education, the limitations on processing information when making an occupational therapy diagnosis are evident.

This study contributes to the knowledge of undergraduates' diagnostic reasoning features, specifically the undergraduate students' capacities and limits to process information during the occupational assessment.

In addition, it may have implications for the education of occupational therapy undergraduates in (a) the modification of the curricula contents to promote the knowledge related to diagnostic reasoning, (b) the consolidation of the skills to analyse and synthesize the information collected during the assessment, and (c) the promotion of the learning of an occupational therapy diagnosis scheme as the best way to consolidate the professional reasoning. A key message from the study is that an inadequate organization of the undergraduate's knowledge to process the data collected during the occupational evaluation can make the learning of an appropriate diagnostic reasoning difficult.

## Data Availability

The data used and/or analysed during the current study are available from the corresponding author on reasonable request.

## Disclosure

The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

## Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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## References

- [1] C. A. Unsworth, "The Clinical reasoning of novice and expert occupational therapists," *Scandinavian Journal of Occupational Therapy*, vol. 8, no. 4, pp. 163–173, 2009.
- [2] E. S. Cohn, "Clinical reasoning: explicating complexity," *American Journal of Occupational Therapy*, vol. 45, no. 11, pp. 969–971, 1991.
- [3] M. H. Fleming, "Clinical reasoning in medicine compared with clinical reasoning in occupational therapy," *American Journal of Occupational Therapy*, vol. 45, no. 11, pp. 988–996, 1991.
- [4] P. Harries, C. Tomlinson, E. Notley, M. Davies, and K. Gilhooly, "Effectiveness of a decision-training aid on referral prioritization capacity: a randomized controlled trial," *Medical Decision Making*, vol. 32, no. 6, pp. 779–791, 2012.
- [5] M. Rassafiani, J. Ziviani, S. Rodger, and L. Dalgleish, "Identification of occupational therapy clinical expertise: decision-making characteristics," *Australian Occupational Therapy Journal*, vol. 56, no. 3, pp. 156–166, 2009.
- [6] J. C. Rogers and M. B. Holm, "Occupational therapy diagnostic reasoning: a component of clinical reasoning," *American Journal of Occupational Therapy*, vol. 45, no. 11, pp. 1045–1053, 1991.
- [7] B. A. Schell and R. M. Cervero, "Clinical reasoning in occupational therapy: an integrative review," *American Journal of Occupational Therapy*, vol. 47, no. 7, pp. 605–610, 1993.
- [8] S. D. Doyle, S. Bennett, and B. J. Dudgeon, "Sensory impairment after stroke: Exploring therapists' clinical decision making," *Canadian Journal of Occupational Therapy*, vol. 81, no. 4, pp. 215–225, 2014.
- [9] P. Faller, J. Hunt, E. Van Hooydonk, Z. Mailloux, and R. Schaaf, "Application of data-driven decision making using Ayres Sensory Integration® With a child with autism," *American Journal of Occupational Therapy*, vol. 70, no. 1, p. 7001220020p1, 2016.
- [10] H. K. Kristensen, T. Borg, and L. Hounsgaard, "Aspects affecting occupational therapists' reasoning when implementing research-based evidence in stroke rehabilitation," *Scandinavian Journal of Occupational Therapy*, vol. 19, no. 2, pp. 118–131, 2010.
- [11] K. Kuipers and J. W. Grice, "Clinical reasoning in neurology: use of the repertory grid technique to investigate the reasoning of an experienced occupational therapist," *Australian Occupational Therapy Journal*, vol. 56, no. 4, pp. 275–284, 2009.
- [12] L. J. Robertson, "Clinical reasoning, part 1: the nature of problem solving, a literature review," *British Journal of Occupational Therapy*, vol. 59, no. 4, pp. 178–182, 2016.

- [13] B. A. B. Schell and J. W. Schell, "Professional reasoning as the basis of practice," in *Clinical and Professional Reasoning in Occupational Therapy*, B. A. B. Schell and J. W. Schell, Eds., Lippincott, Philadelphia, 2008.
- [14] G. S. Tomlin, "Scientific reasoning," in *Clinical and Professional Reasoning in Occupational Therapy*, B. A. B. Schell and J. W. Schell, Eds., Lippincott, Philadelphia, 2008.
- [15] J. Higgs and M. A. Jones, "Clinical decision making and multiple problem spaces," in *Clinical reasoning in the health professions*, J. Higgs, M. Jones, S. Loftus, and N. Christensen, Eds., Butterworth and Heinemann, Sydney, Australia, 2008.
- [16] B. Taylor, D. Robertson, N. Wiratunga, S. Craw, D. Mitchell, and E. Stewart, "Using computer aided case based reasoning to support clinical reasoning in community occupational therapy," *Computer Methods and Programs in Biomedicine*, vol. 87, no. 2, pp. 170-179, 2007.
- [17] C. S. Royce, M. M. Hayes, and R. M. Schwartzstein, "Teaching critical thinking: a case for instruction in cognitive biases to reduce diagnostic errors and improve patient safety," *Academic Medicine*, vol. 94, no. 2, pp. 187-194, 2019.
- [18] L. J. Robertson, "Clinical reasoning, part 2: novice/expert differences," *British Journal of Occupational Therapy*, vol. 59, no. 5, pp. 212-216, 2016.
- [19] D. Robertson, F. Warrender, and S. Barnard, "The critical occupational therapy practitioner: how to define expertise?," *Australian Occupational Therapy Journal*, vol. 62, no. 1, pp. 68-71, 2015.
- [20] C. Chapparo and J. Ranka, "Clinical reasoning in occupational therapy," in *Clinical Reasoning in the Health Professions*, (4<sup>th</sup> Ed), J. Higgs, J. Gail, S. Loftus, and N. Christensen, Eds., Elsevier, Barcelona, 2018.
- [21] C. Unsworth and A. Baker, "A systematic review of professional reasoning literature in occupational therapy," *British Journal of Occupational Therapy*, vol. 79, no. 1, pp. 5-16, 2016.
- [22] B. A. B. Schell, C. A. Unsworth, and J. W. Schell, "Theory and practice: new directions for research in professional reasoning," in *Clinical and Professional Reasoning in Occupational Therapy*, B. A. B. Schell and J. W. Schell, Eds., Lippincott, Philadelphia, 2008.
- [23] R. S. Farber and K. P. Koenig, "Facilitating clinical reasoning in fieldwork: the relational context of the supervisor and student," in *Clinical and Professional Reasoning in Occupational Therapy*, B. A. B. Schell and J. W. Schell, Eds., Lippincott, Philadelphia, 2008.
- [24] B. Hooper, "Therapists' assumptions as a dimension of professional reasoning," in *Clinical and professional reasoning in occupational therapy*, B. A. B. Schell and J. W. Schell, Eds., Lippincott, Philadelphia, 2008.
- [25] R. C. Schaaf, "Creating evidence for practice using data-driven decision making," *American Journal of Occupational Therapy*, vol. 69, no. 2, pp. 6902360010p1-6902360010p6, 2015.
- [26] E. Rochmawati and R. Wiechula, "Education strategies to foster health professional students' clinical reasoning skills," *Nursing and Health Sciences*, vol. 12, no. 2, pp. 244-250, 2010.
- [27] S. Bondoc, "Occupational therapy and evidence-based education," *Education Special Interest Section Quarterly*, vol. 15, no. 4, pp. 1-4, 2005.
- [28] R. Hernández, C. Fernández, and M. P. Baptista, "Concepción o elección del diseño de investigación," in *Metodología de la investigación cualitativa*, (5<sup>th</sup> ed), R. Hernández, C. Fernández, and M. P. Baptista, Eds., McGraw Hill, México DF, 2018.
- [29] M. Sabariego, "La investigación educativa: génesis, evolución y características," in *Metodología de la investigación educativa*, R. Bisquerra, La Muralla, Madrid, 2004.
- [30] The Tuning Occupational Therapy Project Group, *Reference Points for the Design and Delivery of Degree Programmes in Occupational Therapy*, Universidad de Deusto, Bilbao, 2008.
- [31] M. E. Neistadt, J. Wight, and S. E. Mulligan, "Clinical reasoning case studies as teaching tools," *American Journal of Occupational Therapy*, vol. 52, no. 2, pp. 125-132, 1998.
- [32] B. VanLeit, "Using the case method to develop clinical reasoning skills in problem-based learning," *American Journal of Occupational Therapy*, vol. 49, no. 4, pp. 349-353, 1995.
- [33] R. Lysaght and M. Bent, "A comparative analysis of case presentation modalities used in clinical reasoning coursework in occupational therapy," *American Journal of Occupational Therapy*, vol. 59, no. 3, pp. 314-324, 2005.
- [34] K. Adarn, S. Peters, and L. Chipchase, "Knowledge, skills and professional behaviours required by occupational therapist and physiotherapist beginning practitioners in work-related practice: a systematic review," *Australian Occupational Therapy Journal*, vol. 60, no. 2, pp. 76-84, 2013.
- [35] M. N. Ikiugu and S. Smallfield, "Instructing occupational therapy students in use of theory to guide practice," *Occupational Therapy In Health Care*, vol. 29, no. 2, pp. 165-177, 2015.
- [36] D. Gibson, B. Velde, T. Hoff, D. Kvashay, P. L. Manross, and V. Moreau, "Clinical reasoning of a novice versus an experienced occupational therapist: a qualitative study," *Occupational Therapy In Health Care*, vol. 12, no. 4, pp. 15-31, 2000.
- [37] S. R. Wong and G. Fisher, "Comparing and using occupation-focused models," *Occupational Therapy In Health Care*, vol. 29, no. 3, pp. 297-315, 2015.
- [38] K. E. Yancosek and D. Howell, "Integrating the dynamical systems theory, the task-oriented approach, and the practice framework for clinical reasoning," *Occupational Therapy In Health Care*, vol. 24, no. 3, pp. 223-238.
- [39] B. Hooper, K. Adler, and W. Wood, "Strengths and limitations of the occupational therapy model curriculum guide as illustrated in a comprehensive curriculum revision process," *Occupational Therapy In Health Care*, vol. 25, no. 2-3, pp. 194-207, 2011.
- [40] American Occupational Therapy Association, "Occupational therapy practice framework: domain and process (3<sup>rd</sup> Edition)," *American Journal of Occupational Therapy*, vol. 68, Supplement 1, pp. S1-S48, 2014.
- [41] K. Kuipers and J. V. Grice, "The structure of novice and expert occupational therapists' clinical reasoning before and after exposure to a domain-specific protocol," *Australian Occupational Therapy Journal*, vol. 56, no. 6, pp. 418-427, 2009.
- [42] A. A. Wilcock, "Occupation, environment, and community development," in *An occupational perspective on health* (3<sup>rd</sup> ed), A. A. Wilcock and C. Hocking, Eds., Slack, Gloucester City, 2015.
- [43] C. Hocking, "Occupational justice as social justice: the moral claim for inclusion," *Journal of Occupational Science*, vol. 24, no. 1, pp. 29-42, 2017.





## 6. Propuestas de mejora

Los resultados que se presentan en la tesis se muestran como satisfactorios y permiten la apertura de nuevas líneas de investigación. Actualmente se están planteando nuevos estudios y posibilidades para profundizar mejor en el conocimiento del razonamiento profesional en terapia ocupacional.

En relación con el estudio sobre las percepciones individuales, es posible ampliarlo a la población de terapeutas profesionales para tener una comparativa mayor con los resultados obtenidos. A su vez, esto permitiría observar los diferentes estilos de pensamiento entre servicios, años de experiencia u otras características personales de interés.

El estudio que aborda el razonamiento diagnóstico en estudiantes puede ser ampliado a un hipotético proceso de intervención, que permita profundizar más en las diferencias que se producen a lo largo de los años de estudio y la adquisición de competencias profesionales. Con estos resultados sería más fácil adaptar los diferentes contenidos o metodologías de estudio, tratando de mejorar al máximo las competencias de los graduados.

Además, como conclusión en los estudios surge una necesidad muy clara, y es la ausencia de una herramienta estandarizada y objetiva para evaluar de manera concreta el razonamiento profesional del terapeuta ocupacional. El desarrollo de esta herramienta parece vinculado a la creación de un conocimiento concreto sobre el proceso, demostrado empíricamente, por el que el terapeuta crece, evoluciona su razonamiento y se convierte en experto. Por ello, la posibilidad de innovar en este aspecto con tendencias más actuales, como diagnóstico por neuroimagen o el contraste de datos con aspectos neurobiológicos puede ser una forma cada vez más viable de crear nueva evidencia.



## 7. Conclusiones

Las principales conclusiones que pueden obtenerse del presente trabajo de investigación *Evolución del razonamiento clínico del terapeuta ocupacional* son:

1. La investigación sobre el razonamiento profesional en terapia ocupacional es de carácter empírico, predominando los estudios cualitativos. Las principales líneas de investigación se centran en campos específicos de práctica, en el proceso de aprendizaje del razonamiento profesional de los estudiantes en formación y en aspectos teóricos del razonamiento profesional. Existen pocos estudios que se centren en el procesamiento de la información, las modalidades de razonamiento y las características diferenciadoras del razonamiento profesional en terapia ocupacional, frente a otras profesiones sanitarias.
2. Las diferentes percepciones individuales de los estudiantes de terapia ocupacional en su razonamiento profesional se vinculan de manera directa con las modalidades de razonamiento descritas en la literatura. Existe una fuerte correlación entre las modalidades narrativa, interactiva y condicional, con el contenido del razonamiento del estudiante. Estos componentes reflejan una priorización de la práctica centrada en las necesidades del cliente.
3. La capacidad de los estudiantes para analizar y sintetizar la información recabada durante el proceso de evaluación ocupacional inicial, así como la de organizar la información recogida de acuerdo con un diagnóstico ocupacional constituyen los mecanismos básicos para alcanzar un razonamiento profesional eficaz y eficiente.
4. La mejora de los conocimientos teóricos del estudiante a lo largo de su formación no está directamente relacionada con un aumento en la eficacia del razonamiento profesional, dado que esta requiere un aprendizaje específico de destrezas asociadas al razonamiento profesional.
5. A la luz de estos hallazgos, parece recomendable una modificación de los contenidos curriculares de los planes de estudios para:
  - ❖ Promover el conocimiento relacionado con el razonamiento diagnóstico.
  - ❖ La consolidación de las habilidades para analizar y sintetizar la información recopilada durante la evaluación.
  - ❖ La promoción del aprendizaje de un esquema de diagnóstico de terapia ocupacional como la mejor manera de consolidar el razonamiento profesional.



## 8. Bibliografía

- Alderson, S., Foy, R., Bryant, L., Ahmed, S., & House, A. (2018). Using Q-methodology to guide the implementation of new healthcare policies. *BMJ Quality & Safety*, 27(9), 737-742. <https://doi.org/10.1136/bmjqs-2017-007380>
- Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology*, 8, 19-32.
- Arocha, J. F., & Patel, V. L. (2019). Methods in the study of Clinical Reasoning. En J. Higgs & G. M. Jensen, *Clinical Reasoning in the Health Professions* (4.<sup>a</sup> ed.). Elsevier.
- Barnitt, R. E., & Partridge, C. (1997). Ethical reasoning in physical therapy and occupational therapy. *Physiotherapy research international*, 2(3), 178-194.
- Blumberg, P. (2009). Maximizing Learning Through Course Alignment and Experience with Different Types of Knowledge. *Innovative Higher Education*, 34(2), 93-103. <https://doi.org/10.1007/s10755-009-9095-2>
- Bolton, T., & Dean, E. (2018). Self-Determination Theory and Professional Reasoning in Occupational Therapy Students: A Mixed Methods Study. *Journal of Occupational Therapy Education (JOTE)*, 2(3). <https://doi.org/10.26681/jote.2018.020304>
- Brown, S. R. (1993). A primer on Q methodology. *Operant Subjectivity*, 16(3/4), 91-138.
- Brown, S. R. (1996). Q methodology and qualitative research. *Qualitative Health Research*, 6(4), 561-567.
- Brown, S. R. (2008). Q Methodology. En L. M. Given (Ed.), *The SAGE Encyclopedia of Qualitative Research Methods*. SAGE Publications, Inc.
- Brown, T., Etherington, J., & Williams, B. (2017). Emotional intelligence and personality traits as predictors of undergraduate occupational therapy students' teamwork skills: A cross-sectional study. *British Journal of Occupational Therapy*, 80(7), 432-439. <https://doi.org/10.1177/0308022617691539>

Chapparo, C. (1997). *Influences on clinical reasoning in occupational therapy*. Macquarie University.

Chapparo, C., & Ranka, J. (2000). Clinical reasoning in occupational therapy. En J. Higgs & M. Jones (Eds.), *Clinical Reasoning in the Health Professions* (pp. 128-137).

Chapparo, C., & Ranka, J. (2008). Clinical reasoning in occupational therapy. En J. Higgs, M. Jones, S. Loftus, & N. Christensen (Eds.), *Clinical Reasoning in the Health Professions* (3.<sup>a</sup> ed., pp. 265-277). Butterworth-Heinemann Elsevier.

Coates, G. L. F., & Crist, P. A. (2004). Brief or new: Professional development of fieldwork students: occupational adaptation, clinical reasoning, and client-centeredness. *Occupational Therapy in Health Care*, 18(1-2), 39-47.  
[https://doi.org/10.1080/J003v18n01\\_05](https://doi.org/10.1080/J003v18n01_05)

Cohn, E. S. (1991). Clinical reasoning: Explicating complexity. *American Journal of Occupational Therapy*, 45(11), 969-971.

Coker, P. (2009). The effects of an experiential learning program on the clinical reasoning and critical thinking skills of occupational therapy students. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 70(2-B), 924-924.

Coker, P. (2010). Effects of an experiential learning program on the clinical reasoning and critical thinking skills of occupational therapy students. *Journal of Allied Health*, 39(4), 280-286.

Creighton, C., Dijkers, M., Bennett, N., & Brown, K. (1995). Reasoning and the art of therapy for spinal cord injury. *American Journal of Occupational Therapy*, 49(4), 311-317.

Doyle, S. D., Bennett, S., & Dudgeon, B. J. (2014). Sensory impairment after stroke: Exploring therapists' clinical decision making: Examiner les prises de décisions cliniques des ergothérapeutes face aux déficits sensoriels à la suite d'un accident vasculaire cérébral. *Canadian Journal of Occupational Therapy / Revue Canadienne D'Ergothérapie*, 81(4), 215-225. <https://doi.org/10.1177/0008417414540516>

- Dreyfus, S. E., & Dreyfus, H. (1980). A Five-Stage Model of the Mental Activities Involved in Directed Skill Acquisition. *Operations Research Center, 80*(2), 22.
- Dutton, R. E. (1995). *Clinical reasoning in physical disabilities*. Williams & Wilkins.
- Faller, P., Hunt, J., Van Hooydonk, E., Mailloux, Z., & Schaaf, R. (2016). Application of data-driven decision making using Ayres Sensory Integration® with a child with autism. *American Journal of Occupational Therapy, 70*(1), p1-p9. <https://doi.org/10.5014/ajot.2016.016881>
- Fleming, M. H. (1991a). Clinical reasoning in medicine compared with clinical reasoning in occupational therapy. *The American Journal of Occupational Therapy: Official Publication of the American Occupational Therapy Association, 45*(11), 988-996. <https://doi.org/10.5014/ajot.45.11.988>
- Fleming, M. H. (1991b). The therapist with the three-track mind. *The American Journal of Occupational Therapy: Official Publication of the American Occupational Therapy Association, 45*(11), 1007-1014. <https://doi.org/10.5014/ajot.45.11.1007>
- Furze, J., Black, L., Hoffman, J., Barr, J. B., Cochran, T. M., & Jensen, G. M. (2015). Exploration of Students' Clinical Reasoning Development in Professional Physical Therapy Education. *Journal of Physical Therapy Education, 29*(3), 22-33.
- Garbellini, S., Randall, M., Steele, M., Elliott, C., & Imms, C. (2020). Unpacking the application of Q methodology for use in occupational therapy research. *Scandinavian Journal of Occupational Therapy, 1-6*. <https://doi.org/10.1080/11038128.2019.1709542>
- Gillette, N. P., & Mattingly, C. (1987). Clinical Reasoning in Occupational Therapy. *American Journal of Occupational Therapy, 41*(6), 399-400. <https://doi.org/10.5014/ajot.41.6.399>
- Harries, P., Tomlinson, C., Notley, E., Davies, M., & Gilhooly, K. (2012). Effectiveness of a decision-training aid on referral prioritization capacity: A randomized controlled trial. *Medical Decision Making, 32*(6), 779-791. <https://doi.org/10.1177/0272989X12443418>

- Henderson, W., Coppard, B., & Qi, Y. (2017). Identifying Instructional Methods for Development of Clinical Reasoning in Entry-Level Occupational Therapy Education: A Mixed Methods Design. *Journal of Occupational Therapy Education (JOTE)*, 1(2). <https://doi.org/10.26681/jote.2017.010201>
- Hocking, C., & Ness, N. E. (2002). Introduction to the Revised Minimum Standards for the Education of Occupational Therapists—2002. *World Federation of Occupational Therapists Bulletin*, 46(1), 30-33. <https://doi.org/10.1080/20566077.2002.11721124>
- Hocking, C., & Ness, N. E. (2004). WFOT Minimum Standards for the Education of Occupational Therapists: Shaping the Profession. *World Federation of Occupational Therapists Bulletin*, 50(1), 9-17. <https://doi.org/10.1179/otb.2004.50.1.003>
- Hooper, B. (1997). The Relationship between Pretheoretical Assumptions and Clinical Reasoning. *American Journal of Occupational Therapy*, 51(5), 328-338.
- Hooper, B. (2017). Therapists' Assumptions as a Dimension of Professional Reasoning. En B. A. B. Schell & J. W. Schell (Eds.), *Clinical and Professional Reasoning in Occupational Therapy* (2.<sup>a</sup> ed.). Lippincott Williams and Wilkins.
- Huber, C. R., & Kuncel, N. R. (2016). Does College Teach Critical Thinking? A Meta-Analysis. *Review of Educational Research*, 86(2), 431-468. <https://doi.org/10.3102/0034654315605917>
- Jensen, G. M., Resnik, L. J., & Haddad, A. M. (2019). Expertise and Clinical Reasoning. En J. Higgs & G. M. Jensen, *Clinical Reasoning in the Health Professions* (4<sup>a</sup>). Elsevier.
- Johnson, E., Seif, G., Coker-Bolt, P., & Kraft, S. (2017). Measuring Clinical Reasoning and Interprofessional Attitudes. *Journal of Student-Run Clinics*, 3(1), Article 1. <https://journalsrc.org/index.php/jsrc/article/view/24>
- Kielhofner, G., & De las Heras, C. G. (2006). *Fundamentos conceptuales de la terapia ocupacional*. Editorial Médica Panamericana.
- Kristensen, H. K., Borg, T., & Hounsgaard, L. (2012). Aspects affecting occupational therapists' reasoning when implementing research-based evidence in stroke rehabilitation.



- Scandinavian Journal of Occupational Therapy*, 19(2), 118-131.  
<https://doi.org/10.3109/11038128.2011.556197>
- Kuipers, K., & Grice, J. W. (2009). Clinical reasoning in neurology use of the repertory grid technique to investigate the reasoning of an experienced occupational therapist. *Australian Occupational Therapy Journal*, 56(4), 275-284.  
<https://doi.org/10.1111/j.1440-1630.2008.00737.x>
- Levac, D., Colquhoun, H., & O'Brien, K. (2010). Scoping studies: Advancing the methodology. *Implementation Science*, 5, 1-9.
- Liu, K. P. Y., Chan, C., & Hui-Chan, C. (2000). Clinical reasoning and the occupational therapy curriculum. *Occupational Therapy International*, 7(3), 173-183.
- Long, D. M. (2008). *Student understanding and use of clinical reasoning skills in occupational therapy: A phenomenological study*. University of Phoenix.
- Lysaght, R., & Bent, M. (2005). A comparative analysis of case presentation modalities used in clinical reasoning coursework in occupational therapy. *American Journal of Occupational Therapy*, 59(3), 314-324. <https://doi.org/10.5014/ajot.59.3.314>
- Maloney, S. M., & Griffith, K. (2013). Occupational Therapy Students' Development of Therapeutic Communication Skills During a Service-Learning Experience. *Occupational Therapy in Mental Health*, 29(1), 10-26.  
<https://doi.org/10.1080/0164212X.2013.760288>
- Márquez-Álvarez, L.-J., Calvo-Arenillas, J.-I., Talavera-Valverde, M.-Á., & Moruno-Millares, P. (2019). Professional Reasoning in Occupational Therapy: A Scoping Review. *Occupational Therapy International*, 2019, e6238245.  
<https://doi.org/10.1155/2019/6238245>
- Maruyama, S., Sasada, S., Jinbo, Y., & Bontje, P. (2021). A Concept Analysis of Clinical Reasoning in Occupational Therapy. *Asian Journal of Occupational Therapy*, 17(1), 17-25. <https://doi.org/10.11596/asiajot.16.119>

- Matthews, L. K., Mulry, C. M., & Richard, L. (2017). Matthews Model of Clinical Reasoning: A Systematic Approach to Conceptualize Evaluation and Intervention. *Occupational Therapy in Mental Health*, 1-14. <https://doi.org/10.1080/0164212X.2017.1303658>
- Mattingly, C., & Fleming, M. H. (1994). *Clinical Reasoning: Forms of Inquiry in a Therapeutic Practice*.
- McCannon, R., Robertson, D., Caldwell, J., Juwah, C., & Elfessi, A. (2004). Comparison of clinical reasoning skills in occupational therapy students in the USA and Scotland. *Occupational Therapy International*, 11(3), 160-176. <https://doi.org/10.1002/oti.204>
- McCarron, K. (2000). The impact of problem-based learning on clinical reasoning in occupational therapy education. *Impact of Problem-based Learning on Clinical Reasoning in Occupational Therapy Education*, 107 p-107 p.
- McDermott, D. S. (2016). Seeking consensus on prebriefing: Preparing students for Simulation-Based Learning. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 77(3-B(E)). <http://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=2016-37855-216&site=ehost-live>
- Naber, J., & Wyatt, T. H. (2014). The effect of reflective writing interventions on the critical thinking skills and dispositions of baccalaureate nursing students. *Nurse Education Today*, 34(1), 67-72. <https://doi.org/10.1016/j.nedt.2013.04.002>
- Neistadt, M. E. (1987). Classroom as clinic: A model for teaching clinical reasoning in occupational therapy education. *American Journal of Occupational Therapy*, 41(10), 631-637.
- Neistadt, M. E. (1992). The classroom as clinic: Applications for a method of teaching clinical reasoning. *American Journal of Occupational Therapy*, 46(9), 814-819.
- Neistadt, M. E. (1996). Teaching strategies for the development of clinical reasoning. *American Journal of Occupational Therapy*, 50(8), 676-684.

- Neistadt, M. E. (1998). Teaching clinical reasoning as a thinking frame. *The American Journal of Occupational Therapy: Official Publication of the American Occupational Therapy Association*, 52(3), 221-229. <https://doi.org/10.5014/ajot.52.3.221>
- Neistadt, M. E., Wight, J., & Mulligan, S. E. (1998). Clinical Reasoning Case Studies as Teaching Tools. *American Journal of Occupational Therapy*, 52(2), 125-132.
- Occupational Therapy Practice Framework: Domain and Process—Fourth Edition. (2020). *American Journal of Occupational Therapy*, 74(Supplement\_2), 7412410010p1-7412410010p87. <https://doi.org/10.5014/ajot.2020.74S2001>
- Patton, N., & Christensen, N. (2019). Pedagogies for teaching and learning clinical reasoning. En J. Higgs, G. Jensen, S. Loftus, & N. Christensen (Eds.), *Clinical Reasoning in the Health Professions* (4.<sup>a</sup> ed.). Elsevier.
- Pitonyak, J., Nielsen, S., O'Brien, S., Corsilles-Sy, C., Lambert, D., & Jaffe, L. (2020). Critical Thinking in Occupational Therapy Education: A Systematic Mapping Review. *Journal of Occupational Therapy Education (JOTE)*, 4(4). <https://doi.org/10.26681/jote.2020.040403>
- Rassafiani, M., Ziviani, J., Rodger, S., & Dalglish, L. (2009). Identification of occupational therapy clinical expertise: Decision-making characteristics. *Australian Occupational Therapy Journal*, 56(3), 156-166. <https://doi.org/10.1111/j.1440-1630.2007.00718.x>
- Roberts, A. E. (1996). Clinical Reasoning in Occupational Therapy: Idiosyncrasies in Content and Process. *British Journal of Occupational Therapy*, 59(8), 372-376.
- Robertson, D., Warrender, F., & Barnard, S. (2015). The critical occupational therapy practitioner: How to define expertise? *Australian Occupational Therapy Journal*, 62(1), 68-71. <https://doi.org/10.1111/1440-1630.12157>
- Robertson, L. (1996a). Clinical Reasoning, Part 1: The Nature of Problem Solving, a Literature Review. *British Journal of Occupational Therapy*, 59(4), 178-182.
- Robertson, L. (1996b). Clinical Reasoning, Part 2: Novice/Expert Differences. *British Journal of Occupational Therapy*, 59(5), 212-216. <https://doi.org/10.1177/030802269605900507>

Robertson, L. (2013). *Clinical Reasoning in Occupational Therapy: Controversies in Practice*.

<https://doi.org/10.1002/9781118702833>

Rogers, J. C. (1983). Eleanor Clarke Slagle Lectureship-1983; Clinical Reasoning ' : The Ethics, Science and Art. *American Journal of Occupational Therapy*, 37(9), 601-616.

Rogers, J. C. (2009). Occupational Diagnosis. En M. Molineux, *Occupation for occupational therapists*.

Rogers, J. C., & Holm, M. B. (1991). Occupational Therapy Diagnostic Reasoning: A Component of Clinical Reasoning. *American Journal of Occupational Therapy*, 45(11), 1045-1053.

Rogers, J. C., & Masagatani, G. (1982). Clinical reasoning of occupational therapist's during the initial assessment of physically disabled clients. *Occupational Therapy Journal of Research*, 2(4), 195-219.

Scaffa, M. E., & Wooster, D. M. (2004). Effects of problem-based learning on clinical reasoning in occupational therapy. *American Journal of Occupational Therapy*, 58(3), 333-336.  
<https://doi.org/10.5014/ajot.58.3.333>

Scanlan, J. N., & Hancock, N. (2010). Online discussions develop students' clinical reasoning skills during fieldwork. *Australian Occupational Therapy Journal*, 57(6), 401-408.  
<https://doi.org/10.1111/j.1440-1630.2010.00883.x>

Schaaf, R. C. (2015). Creating Evidence for Practice Using Data-Driven Decision Making. *American Journal of Occupational Therapy*, 69(2), p1-p6.  
<https://doi.org/10.5014/ajot.2015.010561>

Schaber, P. (2014). Keynote Address: Searching for and Identifying Signature Pedagogies in Occupational Therapy Education. *American Journal of Occupational Therapy*, 68(Supplement\_2), S40-S44. <https://doi.org/10.5014/ajot.2014.685S08>

Schaber, P., & Shanedling, J. (2012). Online course design for teaching critical thinking. *Journal of Allied Health*, 41(1), e9-e14.

- Schell, B. A. B. (2008). Razonamiento clínico: La base de la práctica. En E. B. Crepeau, E. S. Cohn, & B. A. B. Schell (Eds.), *Willard and Spackman Terapia Ocupacional* (pp. 131-139).
- Schell, B. A. B. (2009). Professional Reasoning in Practice. En E. B. Crepeau, E. S. Cohn, & B. A. B. Schell, *Willard & Spackman's Occupational Therapy* (11.<sup>a</sup> ed.). Philadelphia.
- Schell, B. A. B., & Cervero, R. (1993). Clinical Reasoning in Occupational Therapy an Integrative Review. *American Journal of Occupational Therapy*, 47(7), 605-610.
- Schell, B. A. B., & Schell, J. W. (2017). *Clinical and Professional Reasoning in Occupational Therapy* (2.<sup>a</sup> ed.). Lippincott Williams and Wilkins.
- Schell, B. A. B., Unsworth, C. A., & Schell, J. W. (2008). Theory and practice: New directions for research in professional reasoning. En B. A. B. Schell & J. W. Schell (Eds.), *Clinical and professional reasoning in occupational therapy* (pp. 401-431). Lippincott Williams & Wilkins.
- Schell, J. W. (2018). Teaching for Reasoning in Higher Education. En B. A. B. Schell & J. W. Schell (Eds.), *Clinical and Professional Reasoning in Occupational Therapy* (pp. 4-13). Lippincott Williams & Wilkins.
- Schmidt, H. G., & Boshuizen, H. P. A. (1993). On acquiring expertise in medicine. *Educational Psychology Review*, 5(3), 205-221. <https://doi.org/10.1007/BF01323044>
- Schuwirth, L. W. T., Durning, S. J., Norman, G. R., & van Der Vleuten, C. P. M. (2018). Assessing Clinical Reasoning. En J. Higgs, G. Jensen, S. Loftus, & N. Christensen, *Clinical Reasoning in the Health Professions* (4.<sup>a</sup> ed.). Elsevier.
- Schwartz, K. W. (1991). Clinical reasoning and new ideas on intelligence: Implications for teaching and learning. *American Journal of Occupational Therapy*, 45(11), 1033-1037.
- Seif, G., Coker-Bolt, P., Kraft, S., Gonsalves, W., Simpson, K., & Johnson, E. (2014). The development of clinical reasoning and interprofessional behaviors: Service-learning at a student-run free clinic. *Journal of Interprofessional Care*, 28(6), 559-564. <https://doi.org/10.3109/13561820.2014.921899>

- Simon, H. A. (1980). Problem solving and education. En D. T. Tuma & F. Reif, *Problem Solving and Education: Issues in Teaching and Research*. Erlbaum.
- Sinclair, K. (2004). *A model for the development of clinical reasoning in occupational therapy*. [Hong Kong Polytechnic University].  
<http://search.ebscohost.com/login.aspx?direct=true&db=c8h&AN=106644417&site=ehost-live>
- Sinclair, K. (2007). Exploring the facets of clinical reasoning. En J. Creek, A. Lawson-Porter, J. Creek (Ed), & A. Lawson-Porter (Ed) (Eds.), *Contemporary issues in occupational therapy: Reasoning and reflection* (pp. 143-160). John Wiley & Sons Ltd.  
<http://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=2007-01747-008&site=ehost-live>
- Sladyk, K., & Sheckley, B. (2001). Clinical reasoning and reflective practice: Implications of fieldwork activities. *Occupational Therapy in Health Care*, 13(1), 11-22.  
[https://doi.org/10.1080/J003v13n01\\_02](https://doi.org/10.1080/J003v13n01_02)
- Slater, D. Y., & Cohn, E. S. (1991). Staff Development Through Analysis of Practice. *American Journal of Occupational Therapy*, 45(11), 1038-1044.  
<https://doi.org/10.5014/ajot.45.11.1038>
- Talavera Valverde, M. A. (2015). *Estudio del razonamiento clínico en estudiantes de terapia ocupacional*. Universidade da Coruña.
- Tiernon, P., Hensel, D., & Roy-Ehri, L. (2017). Using Q Methodology in Quality Improvement Projects. *Journal of Obstetric, Gynecologic, and Neonatal Nursing: JOGNN*, 46(4), 601-608. <https://doi.org/10.1016/j.jogn.2017.04.133>
- Tona, J. T. (2003). Variations in clinical reasoning among occupational therapy practitioners. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, 64(1-A), 69-69.

- Turner, A., & Alsop, A. (2015). Unique core skills: Exploring occupational therapists' hidden assets. *British Journal of Occupational Therapy*, 78(12), 739-749.  
<https://doi.org/10.1177/0308022615601443>
- Unsworth, C. A. (2001a). Using a head-mounted video camera to study clinical reasoning. *American Journal of Occupational Therapy*, 55(5), 582-588.
- Unsworth, C. A. (2001b). The clinical reasoning of novice and expert occupational therapists. *Scandinavian Journal of Occupational Therapy*, 8(4), 163-173.  
<https://doi.org/10.1080/110381201317166522>
- Unsworth, C. A. (2004). Clinical reasoning: How do pragmatic reasoning, worldview and client-centredness fit? *British Journal of Occupational Therapy*, 67(1), 10-19.
- Unsworth, C. A., & Baker, A. (2016). A systematic review of professional reasoning literature in occupational therapy. *British Journal of Occupational Therapy*, 79(1), 5-16.  
<https://doi.org/10.1177/0308022615599994>
- Velde, B. P., Wittman, P. P., & Vos, P. (2006). Development of critical thinking in occupational therapy students. *Occupational Therapy International*, 13(1), 49-60.  
<https://doi.org/10.1002/oti.20>
- Watts, S., & Stenner, P. (2012). *Doing Q Methodological Research: Theory, Method & Interpretation*. SAGE Publications, Inc.
- World Federation of Occupational Therapists. (2016). *Minimum Standards for the Education of Occupational Therapists 2016*. World Federation of Occupational Therapists.





## 9. Anexo. Otras Aportaciones

### 9.1. Comunicaciones a Congresos

Título del trabajo: *Cuestionar los fundamentos del razonamiento profesional*

Autores/as (p. o. de firma): Márquez Álvarez, Luis Javier

Autor de correspondencia: Sí

Fecha de celebración: 27/10/2017 Fecha de finalización: 28/10/2017

País de celebración: España

C. Autón./Reg. de celebración: Castilla-La Mancha

Ciudad de celebración: Talavera de la Reina

Entidad organizadora: Universidad de Castilla-La Mancha

Tipo de entidad: Universidad

Nombre del congreso: *Jornada Científico-Técnica Centenario de la Terapia Ocupacional y Día Mundial de la Terapia Ocupacional*

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Título de la publicación: *El razonamiento clínico de terapia ocupacional, el proceso cognitivo más allá de la toma de decisiones*

Autores/as (p. o. de firma): Márquez Álvarez, Luis Javier

Autor de correspondencia: Sí

Fecha de inicio: 04/05/2018 Fecha de finalización: 05/05/2018

País de celebración: España

C. Autón./Reg. de celebración: Castilla y León

Ciudad de celebración: Salamanca

Entidad organizadora: Salamanca Innova

Tipo de entidad: Asociaciones y Agrupaciones

Nombre del congreso: *I Jornadas de Jóvenes Investigadores INNOVA Salamanca*

---

Título de la publicación: *Replanteando la oferta formativa sanitaria en la perspectiva del razonamiento profesional. Un ejemplo desde Terapia Ocupacional*

Autores/as (p. o. de firma): Márquez Álvarez, Luis Javier; Talavera Valverde, Miguel Ángel; Moruno Miralles, Pedro; Calvo Arenillas, José Ignacio

Autor de correspondencia: Sí

Fecha de inicio: 29/11/2018 Fecha de finalización: 30/11/2018

País de celebración: Portugal

Ciudad de celebración: Coimbra

Entidad organizadora: Universidade de Coimbra

Tipo de entidad: Universidad

Nombre del evento: *III Congresso Internacional Desafios da Qualidade em Instituições de Ensino Superior: das políticas à practica*

---

Título del trabajo: *Cuestionar los fundamentos del razonamiento profesional*

Autores/as (p. o. de firma): Márquez Álvarez, Luis Javier; Moruno Miralles, Pedro; Talavera Valverde, Miguel Ángel; Calvo Arenillas, José Ignacio

Autor de correspondencia: Sí

Fecha de celebración: 09/02/2019 Fecha de finalización: 10/02/2019

País de celebración: España

C. Autón./Reg. de celebración: Castilla y León

Ciudad de celebración: Valladolid

Entidad organizadora: Colegio Profesional de Terapeutas Ocupacionales de Castilla y León

Tipo de entidad: Asociaciones y Agrupaciones

Nombre del congreso: *VIII Jornadas Castellano-leonesas de Terapia Ocupacional*

## 9.2. Publicaciones

Tipo de producción: Artículo científico

Título de la publicación: *Replanteando la oferta formativa sanitaria en la perspectiva del razonamiento profesional. Un ejemplo desde Terapia Ocupacional*

Fecha de publicación: 10/10/2019

ISBN/ISSN: 2182-2883

Tipo de soporte: Revista

Editorial: Escola Superior de Enfermagem de Coimbra

Autor de correspondencia: Sí

Autores/as (p. o. de firma): Márquez Álvarez, Luis Javier; Talavera Valverde, Miguel Ángel; Moruno Miralles, Pedro; Calvo Arenillas, José Ignacio

Nombre de la publicación: Revista de Enfermagem Referência

Volumen: 19 – Supl

### 9.3. Actividad docente

Entidad de realización: Universidad de Castilla-La Mancha

Titulación universitaria: Grado en Terapia Ocupacional

Nombre de la asignatura/curso: Introducción a la Terapia Ocupacional. Fundamentos teóricos y metodológicos

Nº de horas: 2

Fecha de inicio: 20/02/2018 Fecha de finalización: 20/02/2018

Tipo de entidad: Universidad

Facultad, instituto, centro: Facultad de Terapia Ocupacional, Logopedia y Enfermería

Tipo de docencia: Teórica presencial

Tipo de asignatura: Obligatoria

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Entidad de realización: Universidad de Castilla-La Mancha

Titulación universitaria: Grado en Terapia Ocupacional

Nombre de la asignatura/curso: Introducción a la Terapia Ocupacional. Fundamentos teóricos y metodológicos

Nº de horas: 2

Fecha de inicio: 02/04/2019 Fecha de finalización: 02/04/2019

Tipo de entidad: Universidad

Facultad, instituto, centro: Facultad de Terapia Ocupacional, Logopedia y Enfermería

Tipo de docencia: Teórica presencial

Tipo de asignatura: Obligatoria

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Entidad de realización: Universidad de Málaga

Titulación universitaria: Grado en Terapia Ocupacional

Nombre de la asignatura/curso: Practicum IV

Nº de horas: 4

Fecha de inicio: 12/04/2021 Fecha de finalización: 12/04/2021

Tipo de entidad: Universidad

Facultad, instituto, centro: Facultad de Ciencias de la Salud

Tipo de docencia: Teórica presencial (telemática)

Tipo de asignatura: Obligatoria

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