[Translation and Revision of the scientific text «La mente del gato doméstico»: analysis and reflection]

Master's dissertation written by

[MARIANNA BARMPOUTI]

Supervised by

[Kevin Kostello]

MASTERS IN PROFESSIONAL TRANSLATION
UNIVERSITAT ROVIRA I VIRGILI

TARRAGONA, [2022]

Plagiarism disclaimer

I declare that the assignment here submitted is original except for source material explicitly acknowledged;

I also acknowledge that I am aware of University policy and regulations on honesty in academic work, and of the disciplinary guidelines and procedures applicable to breaches of such policy and regulations, as contained in the University website

FULL NAME: Marianna Georgiou Barmpouti

DATE: 14/05/2022

SIGNATURE:

Declaración de autoría

Yo, [MARIANNA GEORGIOU BAMPOUTI] con documento de identificación [AK009926], declaro que

(i) este trabajo es de mi autoría y que, en los casos en los que me he basado en otras fuentes, así lo he reconocido explícitamente, tanto en el texto como en la lista de referencias bibliográficas donde dichas obras aparecen debidamente citadas.

(ii) entiendo qué es el plagio y las consecuencias que plagiar conlleva según la normativa de la Universidad y sus indicaciones al respecto.

Name of the student: Marianna Georgiou Barmpouti
Year: 2022
Signature:

Table of contents

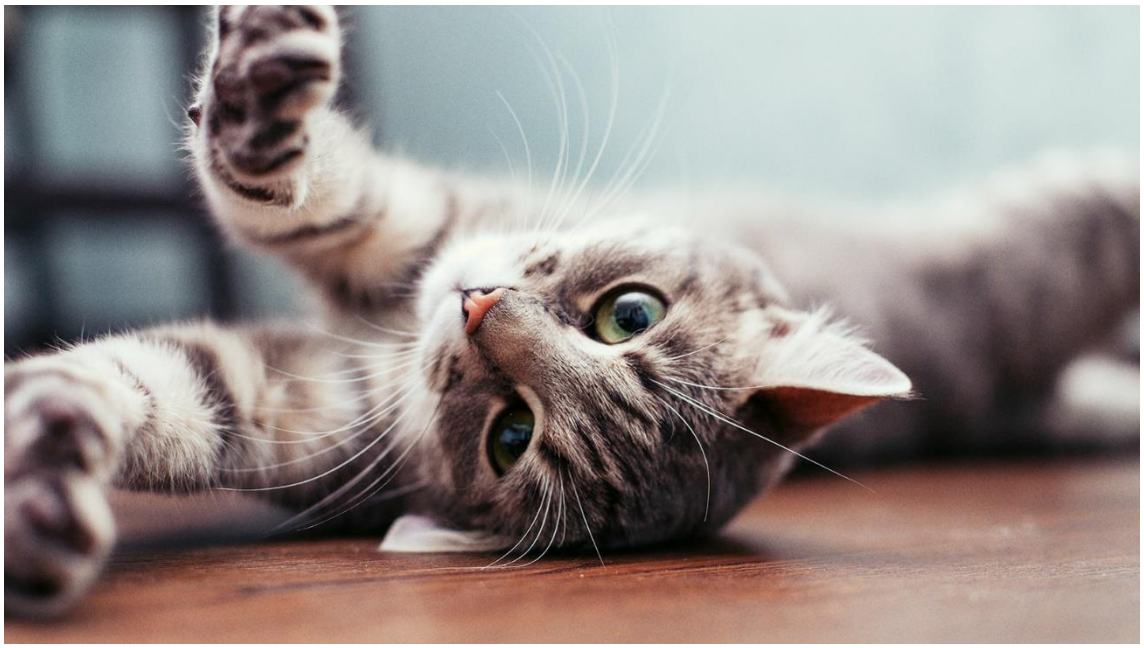
Introduction

This paper intends to analyse the difficulties that I encountered during the translating and revising process of the text «La mente del gato doméstico». For the Translation/Revision project my responsibility was to translate the second half of the aforementioned text and revise the first half which was translated by my partner, Nicholas. For the translating part, I decided to use Machine-Assisted Human Translation. To accomplish this, I specifically used the CAT tool "Matecat". Additionally, I used the multilingual online dictionaries "Linguee" (2022), "Glosbe" (2011) and the Spanish-English dictionary "Spanishdict" (2014), which were very useful for this process as far as idiomaticity and terminology are concerned.

«La mente del gato doméstico» is a scientific text, which presents certain difficulties related to the length of the sentences and the punctuation used. Using the copy editing rules as well as the style editing guidelines and Mossop's revision parameters, I intend to provide a wide variety of examples regarding various linguistic phenomena and suggest solutions to each problem. More specifically, I aim to compare the original text to the draft translation and the self-revised version. I will also analyse the changes I made on my partner's translated part as well as evaluate the suggestions he made for my proposed translation. Moreover, my master's dissertation entails a critical assessment of the budget and the invoice of the translation. As the requirements of the client were different compared to the ones described in the advertisement, it is logical that the budget and the invoice differ significantly, too. Last but not least, throughout the paper there are various reflections on every step of the process that I followed and conclusions based on the whole translating and revising process.

ORIGINAL TEXT

La Mente del Gato Doméstico *Felis Sivestris Catus*



PREÁMBULO

Con fama de independientes y poco apegados a sus cuidadores, lo cierto es que los gatos son unos excelentes compañeros para cualquier hogar. Pueden ser tan cariñosos como los perros, pero van a presentar considerables diferencias, no solo físicas. Es básico que conozcan el carácter, el comportamiento y las necesidades, es decir, todas las características del gato, antes de adoptar uno.

Son muchas las cualidades de los gatos. Inteligentes, elegantes o ágiles son solo algunos de los calificativos que podemos utilizar para referirnos a este felino que se ha adaptado a la convivencia con los humanos y a vivir tanto en el interior de sus hogares como en las ciudades, formando lo que se denominan colonias. Los gatos se acercaron a las personas hace unos 10.000 años, atraídos por la abundancia de roedores que rondaban los asentamientos humanos, que se dieron cuenta de la valía del gato para controlar estas plagas, pero, además, en civilizaciones como la egipcia los gatos fueron animales sagrados, dioses y tan respetables como para ser enterrados con honores.

Con el paso de los años, la relación entre gatos y humanos ha ido experimentando distintos altibajos, pero los felinos siempre han logrado adaptarse a cada situación para sobrevivir.

En cuanto a las características físicas del gato, estamos ante un mamífero cuadrúpedo, con cola, aunque el gato de Manx carece de ella, garras retráctiles y pelo que recubre todo su cuerpo. Posee unos 230 huesos que le permiten una gran

flexibilidad y elasticidad. Destacan sus bigotes, que son pelos modificados con función sensitiva.

Su coloración es muy variable y puede ser monocolor, bicolor o tricolor y presentar diferentes patrones atigrados y longitudes. Aunque hay variaciones entre ejemplares y razas más grandes o más pequeñas, podemos establecer un peso medio de entre 3 y 5 kg.

Además, los gatos son animales vivíparos, lo que quiere decir que paren a sus crías vivas en camadas de unos 4-5 gatitos que serán alimentados con la leche de su madre durante sus primeras semanas de vida. Destaca también su sentido de la vista, del oído y del olfato, lo que facilita su vida como animal depredador. Su temperatura corporal se encuentra entre 38-39 ºC.

Los gatos son animales carnívoros estrictos. Su alimentación en el medio natural se basaba en la caza de roedores, aves y lagartos y no es raro que ocasionalmente ingieran plantas, supuestamente para complementar su dieta.

De entre las características del gato destaca su carácter, aunque encontraremos tremendas variaciones en función del ejemplar y de las experiencias que haya vivido a lo largo de su vida. Podemos destacar su rica comunicación, en la que se incluye el lenguaje corporal y sonidos como los maullidos, los bufidos y los ronroneos. Las feromonas que emite y detecta son otra forma muy importante de comunicación.

Los gatos, excepto la gata y sus camadas, son de hábitos solitarios. Aunque pueden vivir en colonias o colectividades, también es cierto que es una situación que les puede resultar estresante, lo que manifestarán con eliminación inadecuada, peleas, disminución del apetito, etc. Son amantes de las rutinas, por lo que, cualquier cambio debe realizarse tras un período de adaptación. Al contrario que los perros, no requieren el aprendizaje de órdenes básicas, aunque sí conviene establecer unas normas de convivencia y dedicarles tiempo de juego y atenciones.

RESUMEN

La ciencia del bienestar animal posee amplia investigación en las esferas de la salud física y expresión comportamental (naturalidad), pero en lo que respecta a la esfera mental existe una mayor complejidad y menos estudios a pesar de ser uno de los tres pilares fundamentales del bienestar animal. El gato se convirtió en la mascota preferida en gran parte del mundo; sin embargo, se desconoce aún mucho de la especie y entender la mente felina es fundamental para proporcionarle las condiciones de bienestar adecuadas, ya que existe una relación bidireccional entre cognición y bienestar y esta es una especie que requiere ambientes enriquecidos de forma compleja y estimulante. El objetivo de esta revisión fue describir las diferentes investigaciones que a la fecha han buscado entender la mente del gato doméstico *Felis silvestris catus*. La investigación cognitiva realizada en gatos incluye percepción, permanencia de objetos, memoria, causalidad física, cantidad y discriminación de tiempo, sensibilidad de los gatos a las señales humanas, reconocimiento vocal y comunicación, vínculos de apego, personalidad, y salud cognitiva; demostrándose en todos los casos la habilidad del gato en estas áreas. Los estudios en cognición demuestran la capacidad del gato para aprender, hacerlo rápido y modificar su conducta tras este aprendizaje, lo que nos permite además suponer algún grado de consciencia. Se demuestra la sintiencia del gato por su capacidad de experimentar emociones negativas (miedo y dolor) y positivas (alegría, "amistad"). La mente del gato es única y es extremadamente importante usar metodologías de estudio e interpretar resultados dentro del contexto de la especie. Podemos concluir que las investigaciones científicas a la fecha evidencian las capacidades de sintiencia y cognición del gato doméstico, y abren la ventana para que se continúe investigando sobre la mente felina y sus repercusiones en la maximización de su nivel de bienestar y en la otorgación de la protección que merece.

Palabras clave:

Felino, mente, bienestar, cognición, sintiencia

ABSTRACT

The science of animal welfare holds extensive research in the spheres of physical health and behavioral expression (naturalness), but regarding the mental sphere there is greater complexity and fewer studies, despite being one of the three fundamental pillars of animal welfare. The cat became the favorite pet in much of the world. However, there is a lack of research of this species, and understanding the feline mind is essential to provide adequate welfare conditions. In addition, there is a bidirectional relationship between cognition and welfare and this is a species that requires enriched environments in a more complex and stimulating way. The purpose of this review was to describe the different investigations that have tried to understand the mind of the domestic cat *Felis silvestris catus*. Cognitive research conducted on cats includes perception, object permanence, memory, physical causality, quantity and time discrimination, sensitivity of cats to human signals, vocal recognition and communication, attachment bonds, personality, and cognitive health; demonstrating in all cases the ability of the cat in these areas. Studies in cognition have demonstrated the ability of the cat to learn, do quickly and modify his behavior after learning, which also allows us to assume some degree of consciousness. The sentience of the cat is demonstrated by his ability to experience negative (fear and pain) and positive (joy, "friendship") emotions. The cat's mind is unique and it is extremely important to use some methods and interpret results in the context of the species. We can conclude that scientific research to date shows the capacities of sentience and cognition of the domestic cat, and opens the window for further research on the feline mind and its repercussions on maximizing its level of welfare and granting the protection they deserve.

Keywords:

Feline, mind, welfare, cognition, sentience

INTRODUCCIÓN

Se reconoce que las esferas del bienestar animal (física, mental y naturalidad; Fraser, 2008), tienen una interrelación e interdependencia entre sí; sin embargo, se han realizado muchas más aproximaciones y trabajo científico en las esferas física y comportamental (naturalidad), seguramente por su mayor accesibilidad. Por su parte, la mente sigue siendo una incógnita, aún en animales humanos, y su estudio en animales no-humanos no lleva más que algunas décadas; no obstante, es uno de los tres pilares fundamentales de esta ciencia del bienestar animal.

El cerebro humano es una masa de aproximadamente 1,4 Kg, compuesta de unos 100.000 millones de neuronas interconectadas, y es el órgano que hace capaz al humano de reflexionar sobre su propia naturaleza y la del universo. Según el profesor Aznar (s.f.) de la facultad de Psicología de la Universidad de Barcelona, el cerebro de los animales por su parte, es el principal órgano que regula la supervivencia de cada especie, representando en su interior de manera simbólica (cognitivamente) la información que captan los sentidos en 'mapas cognitivos' (patrones neurales).

Los mapas cognitivos han sido clasificados como mapas interoceptivos, propioceptivos o exteroceptivos y proveen información sobre el estado de vísceras, sobre el aparato músculo-esquelético y sobre el estado del mundo exterior, respectivamente (Aznar, s.f.). Los mapas cognitivos son esenciales en la configuración de la mente de un animal que "observa y se observa a sí-mismo", haciendo de la mente de cada animal algo "genuino, personal e intransferible" (Aznar, s.f.). La mente se vale de estos mapas para crear una representación del mundo externo y montar una respuesta consistente. Posteriormente, los mapas quedan en la memoria, y pueden ser revividos a través del recuerdo imaginativo, para planificar e inventar mejores respuestas (Aznar, s.f.) ¿No hacen esto mismo los animales no-humanos, incluyendo los gatos?

Según Ribes (2000), la mente es una entidad no espacial que cohabita funcionalmente con lo físico, y que se representa como experiencia individual. La arquitectura de la mente se conforma entre otros elementos de la memoria, el pensamiento, la imaginación, la atención y la consciencia (Ribes, 2000); por lo tanto, demostrar algunas de estas características en el gato configuraría su mente. El estudio de la mente humana en psicología se hace a través de la teoría de la mente, y según García García (2008) "gracias a la Teoría de la Mente las personas nos comunicamos e interaccionamos, producimos y transmitimos la cultura". Tirapu y col. (2007) reportan que el concepto de teoría de la mente se refiere a la habilidad para comprender y

predecir la conducta de otras personas, sus conocimientos, sus intenciones, sus emociones y sus creencias. El ser humano dispone de capacidades mentales que le permiten interpretar y predecir la conducta de los otros. ¿Tiene el gato esas mismas habilidades?

La inteligencia artificial es una de las tendencias y retos más grandes del mundo moderno. Desarrollar algoritmos que hagan "inteligentes" a máquinas requiere modelos específicos de toma de decisiones. La mente del gato ha sido usada para formular un algoritmo de inteligencia artificial (Cat Swarm Optimization - CSO) (Chu, 2007), con el que, a través del modelado de los comportamientos de gato, se busca resolver los problemas de optimización matemática (selección de la mejor opción, respecto a algún criterio, de un conjunto de elementos disponibles). Lo que ha llamado la atención de los ingenieros es que los gatos tienen un nivel muy alto de alerta, incluso cuando están descansando. Así que dos de los principales rasgos de comportamiento de los gatos se modelan para la propuesta de optimización, estos rasgos se denominan "Modo de búsqueda" y "Modo de seguimiento". La combinación de estos dos modos permite a CSO un mejor rendimiento. Chu (2007) indicó que en el algoritmo propuesto utilizaron "gatos y el modelo de comportamiento del gato para resolver la optimización de problemas, es decir, usamos gatos para representar los conjuntos de soluciones". Sin entrar en detalles de ingeniería, es, cuando menos, interesante para la discusión que la mente felina sea considerada para un modelo como este, por lo que implica que la observación de la especie y su comportamiento sea de relevancia para la toma de decisiones. ¿Evidencia esto la mente felina y su cognición?

El estudio científico de la consciencia busca explicar una gama de procesos psicológicos, como la integración de información, el foco de atención, el control deliberado de la conducta, la capacidad de un sistema para acceder a sus propios estados internos y la capacidad de informar sobre el estado mental de sí mismo (Chambliss, 2018); la consciencia es pues una capacidad de percibir el mundo, reconocerse y actuar en este. El fenómeno de la mente animal no solo causa una gran curiosidad al mundo científico en el presente, si no que se convertiría en el proceso determinante para poder descifrar si puede existir esa consciencia sobre lo que aprenden y sienten las diferentes especies. Esto sería un gran avance en la comprensión y defensa de los animales no-humanos, y la ciencia del bienestar animal; ya que no solo se probaría el sentir como un proceso bioquímico y neurológico, si no que quedarían de patente no sólo el sufrimiento, sino otras emociones tanto negativas como positivas, como estados

mentales. Las actividades mentales son entre otras percibir, recordar, atender y pensar, la mente al fin de cuentas construye y reconstruye el mundo a partir de las sensaciones y su contacto con el mundo real (Ribes, 2000). Quizá para obtener conclusiones exactas al respecto falte mucho, pero el análisis de los resultados de investigaciones sobre cognición, toma de decisiones, razonamiento, la psiquis, entre otros, comienzan a dar pistas sobre el fenómeno de la mente animal.

Actualmente, el gato doméstico es la mascota más popular en gran parte del mundo; sin embargo, es quizá la especie doméstica en que menos estudios se han realizado en esta área. El objetivo de esta monografía es describir las diferentes investigaciones que a la fecha han buscado entender la mente del gato doméstico *Felis silvestris catus*, y así poder dar respuesta a preguntas como: ¿tienen los gatos capacidades cognitivas? Específicamente, ¿pueden sentir, aprender, recordar y modificar su comportamiento según sus experiencias previas? Se inicia esta revisión abordando la sintiencia y la capacidad del gato doméstico de sentir emociones como el dolor y el miedo. Luego se revisa la literatura sobre consciencia en general y lo que se puede inferir sobre la del gato. Finalmente, se discute la literatura sobre diferentes capacidades cognitivas que se ha demostrado el gato doméstico posee. Siempre que sea posible, se incluyen recomendaciones para futuras investigaciones y consideraciones para mejorar el bienestar de los gatos.

1. SINTIENCIA

Desde Jeremy Bentham (s. XVIII – XIX dc), padre del utilitarismo, y su postulado sobre la importancia de si los animales pueden sentir, más que si pueden pensar o hablar, se inicia un movimiento en torno al bienestar animal que define el desarrollo del término "sintiencia", comprendida como la capacidad de sentir emociones tanto placenteras como negativas (FAWC, 2014). Actualmente, dos siglos después, no debería ser un desafío tener que probar esta cualidad en ninguna especie, cuando menos de vertebrado superior, con los avances de la neurofisiología y la medicina en general que demuestran los circuitos neuronales, y la bioquímica del dolor y las sensaciones. Hoy se define sintiencia como el tener la consciencia y la capacidad cognitiva necesarias para tener sentimientos (Broom, 2014). Por supuesto, se entiende la complejidad de demostrar la consciencia, el sufrimiento y más aún, la metacognición del individuo animal. Broom (2014) propone que es más probable que a un animal se le considere sintiente si este puede aprender, aprende rápido y comete menos errores

después de aprender, lo que debería suponer algún grado de consciencia. Por aquí iniciaremos el camino para intentar dilucidar la mente y la cognición del gato doméstico.

Los gatos son capaces de experimentar sensaciones de dolor, miedo e incomodidad; los circuitos neuronales análogos al humano para estas sensaciones existen y estudios como el de Moody y col. (2018) muestran cómo presentan respuestas negativas de tipo simpático, como dilatación pupilar y aumento de la frecuencia respiratoria, a la manipulación aversiva. Estos indicadores fisiológicos del bienestar que se asocian al estrés y son evidencia de emociones mentales con valencia negativa; demuestran la capacidad de sentir dolor y miedo del gato frente a una manipulación en la clínica veterinaria que le es aversiva. El mismo estudio, muestra respuestas comportamentales como lamido, cambios de postura o posición de orejas que dependían del tipo de manipulación (aversiva o suave) y del temperamento del gato (amistoso u hostil). Los indicadores comportamentales de bienestar como los nombrados, también son usados para demostrar la valencia (positiva o negativa) de las emociones que experimenta el animal. El comportamiento y las posturas son igualmente indicadores de la emoción que experimenta el animal a su manipulación (Yeates, 2016). Lo anterior, en el gato es particularmente importante, dado lo crítico que puede ser, para este y para el humano que lo manipula, el nivel de estrés que puede presentar el animal; por ello hoy día se habla de proporcionar experiencias "amistosas" para el gato (*catfriendly* o *feline-friendly*) durante su manipulación y toda la experiencia de la atención veterinaria, incluso en su ambiente, como lo reporta Rodan y col. (2011), quienes indican que diferentes técnicas de manejo ambiental y manipulación no aversiva pueden generar menos estrés al gato.

Se ha demostrado que el temperamento está fuertemente relacionado con la lateralidad motora en el gato (uso preferente de una de sus patas delanteras), y que la presencia o ausencia de lateralización se relaciona directamente con la expresión de emoción, independiente de la dirección del sesgo lateralizado. Específicamente, durante una prueba de búsqueda de alimento y test de temperamento, los gatos clasificados como ambilaterales tienden a responder de una manera más temerosa, mientras que los gatos que tenían una preferente lateralización (uso preferente de su pata izquierda o derecha, más no de ambas) fueron animales más confiados. Estos resultados estuvieron alineados con las percepciones de los propietarios de cada gato sobre su personalidad. Los gatos ambilaterales fueron categorizados por sus dueños como animales más

agresivos y menos cariñosos, obedientes y amigables. Contrario a los gatos con preferencia lateral, que fueron descritos por sus dueños como animales amigables y cariñosos. La descripción de temperamentos en este estudio, de la cual se hablará más adelante, y su asociación con la lateralidad es muy interesante; el hecho de que existan tendencias comportamentales según la presencia o ausencia del sesgo lateral, muestra el uso de diferentes regiones anatómicas y de los hemisferios cerebrales, y la descripción de los propietarios sobre la personalidad de los gatos evidencia la presencia de emociones de manera correspondiente con los resultados de los test. (McDowell y col., 2016).

El sexo también ha sido identificado como un factor asociado a la lateralidad en gatos. Wells y McDowell (2019) reportan que los machos tienen preferencia por usar su pata izquierda, mientras que las hembras prefieren la derecha, y estos investigadores buscan entender la relación entre lateralidad y raza, con el fin de conectar las personalidades y temperamentos con esos dos elementos. Los resultados que obtuvieron concuerdan con la teoría de la valencia emocional de la lateralidad, que había sido estudiada por Quaranta y col. (2007) respecto al movimiento de la cola en perros. En ese estudio se mostró la diferencia en la asimetría y amplitud del movimiento de la cola del perro según las emociones causadas por diferentes estímulos visuales. Para el caso de los gatos se demostró una relación entre lateralidad y razas felinas propensas a comportamientos y emociones reactivas, mostrando diferentes patrones de uso de la pata con respecto a gatos y razas con temperamentos menos reactivos. Aunque no se encontró una completa concordancia en tales disposiciones, se abre la puerta a más estudios que puedan determinar estas relaciones y puedan ser un referente para reconocer temperamentos y facilitar la elección de una mascota mejorando así la relación humano-gato y el bienestar de ambos.

El siguiente paso ha de ser investigar sobre cuáles emociones positivas y placenteras es capaz de experimentar un gato, ya que el bienestar animal no se concibe, hoy en día, solo al evitar emociones negativas si no al proporcionarles experiencias con emociones positivas. ¿Puede un gato experimentar placer o alegría? Fermo y col. (2019) buscaron identificar vocalizaciones distintas al maullido (el gato es de las especies más vocales), en relación a una experiencia agradable y una desagradable y para ello usaron un grupo de 74 gatos divididos en 2 grupos. Solo el grupo expuesto a una experiencia positiva (un bocado favorito) produjo vocalizaciones específicas distintas del maullido como trino, chillidos, ronroneos y parloteos, mientras que durante la situación aversiva

(transporte en vehículo), no se observó una vocalización distinta a los maullidos. Los autores reportan en sus resultados la relevancia de usar el estudio de las vocalizaciones para determinar el estado de valencia emocional en gatos.

2. CONSCIENCIA

La comprensión de la consciencia y la mente tanto en humanos como en otras especies sigue siendo una incógnita en estudio. Por lo tanto, es claro que no debemos basar la ciencia del bienestar animal en el supuesto de que comprendemos la consciencia o podemos decidir qué especies son o no conscientes. El bienestar animal es demasiado importante como para esperar hasta que el problema de la consciencia se haya resuelto (Dawkins, 2017). Sin embargo, el bienestar animal puede verse beneficiado de comprender que, si los animales pueden razonar y son capaces de procesos cognitivos, pueden entonces tener consciencia, consciencia de sus emociones, consciencia de lo que sienten y tendría por tanto mayores implicaciones en nuestra responsabilidad en el trato hacia los animales no-humanos. A pesar de las dificultades de estudiar la consciencia animal, no debemos abandonar la búsqueda para llegar a comprender el problema de la relación entre el cerebro y la experiencia en las diferentes especies. En el gato, hay una mayor dificultad por la poca información y estudios al respecto, pero hemos de aprovechar y enfrentar las dificultades de manera objetiva, revisando la información disponible, investigando los mecanismos de comportamiento para intentar concluir si involucran o no vías conscientes, evitando la presión de si es relevante o no para el bienestar animal.

La declaración de Cambridge sobre la consciencia (Low, 2012) concluye que los animales no-humanos, "incluidos todos los mamíferos y aves, y muchas otras criaturas, incluidos los pulpos", tienen consciencia. En esta, un prominente grupo internacional de neurocientíficos, neurofarmacólogos, neurofisiólogos, neuroanatomistas y neurocientíficos de la computación llegó a esta conclusión tras examinar los sustratos neurobiológicos de la experiencia consciente y otros comportamientos relacionados en seres humanos y animales no-humanos. El gato como mamífero, entra en esta consideración al poseer los sustratos neurológicos que generan la consciencia, aunque se requieren más estudios específicamente con felinos en esta área.

Adicionalmente, hemos de considerar que, para acercarnos a la mente de otra especie, debemos entender como esta comprende, conoce y responde, es decir, tratar de entender la "especeidad" de esa especie y tratar de "ver a través de sus ojos", o lo que

Rollin (2017) llamaría de "*Catness of the cat*" ("la gaticidad del gato") que aquí nos sirve para llamar la atención sobre esa necesidad de estudiar y entender al gato desde lo que es; un gato. En efecto, si se comparan los gatos con los perros, estos últimos son seres sociales, y es muy probable que reconozcan a su familia humana como su "manada", mientras que el gato, a pesar de poder vivir en comunidades, bajo ciertas circunstancias como se ha discutido, sigue siendo un ser individual. Por tanto, quizá no podamos esperar observar en el gato el mismo tipo de respuesta "empática" que si se ha observado en perros, entendiendo el ser empático como un individuo que tiene "la habilidad de entender y compartir los sentimientos de otro individuo" (Cambridge Dictionary), y su ausencia tampoco implicaría una ausencia de capacidad de consciencia sobre el estado del otro. En el capítulo sobre percepción se revisará la evidencia sobre la discriminación del gato para ser empático con su humano, mas no con extraños, y la empatía del perro generalizada a los humanos, lo cual también podría tener relación con el tiempo de domesticación como ya se discutió.

Se han realizado estudios en humanos mostrando que las personas pueden responder emocionalmente a un rostro de forma muy diferente dependiendo de si esa cara muestra una expresión feliz, triste o enojada, incluso cuando no tienen conciencia consciente de haber visto un rostro (Dimberg y col, 2002). Según ese estudio, nuestra capacidad de interpretar la expresión emocional de un rostro humano puede ser bastante inconsciente, como un estímulo que a través del hemisferio derecho alcanza rápidamente la amígdala por vía subcortical, ruta distante de las vías corticales asociadas con consciencia, más similar al procesamiento de estímulos de amenaza. El punto relevante es que los humanos tenemos diferentes vías de procesar información y generar una amplia gama de comportamientos, algunos de los cuales implican consciencia y otros no, por tanto, deberíamos ser cuidadosos al emitir conclusiones al respecto de las observaciones en gatos, más aún por las diferencias entre especies. Por ejemplo, existe diferencia entre la ruta de la experiencia de un sabor y lo agradable que es entre primates y roedores, mientras los primeros lo experimentan en la corteza, en roedores las vías del gusto están conectadas de manera diferente, con conexiones subcorticales que evitan la corteza por completo y hacen conexiones directamente al hipotálamo y la amígdala; así que a pesar de que ambos pueden hacer aprendizajes con el gusto, no podríamos tener certeza de la consciencia de este en roedores (Rolls, 2013), o ¿podría ser que las vías conscientes sean diferentes entre especies? Estudios similares en gatos se discuten en el capítulo de cognición.

Reconocida la dificultad para hablar de consciencia, podemos abordar el problema desde la cognición. Independientemente del nivel de consciencia, es claro que los animales tienen la capacidad de recibir información a través de los sentidos, procesar, retener y decidir actuar en consecuencia (Broom, 2014). La investigación de la cognición del gato nos puede dar entonces algunas pistas.

3. COGNICIÓN

Aunque millones de gatos conviven con humanos en todo el mundo, la comunidad científica sólo está comenzando a estudiar y comprender la cognición y el comportamiento de estos (Vitale, 2017b). La definición más comúnmente aceptada de cognición, fue proporcionada por la psicología evolutiva como las acciones o procesos mentales que posibilitan la adquisición, procesamiento, almacenamiento y uso de información (Shettleworth, 2010). Por su parte, Vitale (2018) define cognición felina como una amplia gama de experiencias felinas que son parte del comportamiento, incluyendo la detección, percepción, aprendizaje, recordar (memoria) y razonar.

3.1. Percepción

La percepción es el proceso por el cual un individuo se da cuenta de los estímulos del entorno a través de sus sentidos (Vitale, 2018). A primera vista, ningún miembro de la familia Felidae sería un compañero probable del ser humano. La mayoría de felinos llevan vidas solitarias y sólo participan en comportamientos sociales para la reproducción y crianza. Los únicos Felidae que conviven en grupos sociales son los leones (*Panthera leo*), los guepardos (*Acinonyx jubatus*), y en ocasiones, el gato doméstico (*Felis silvestris catus*) que puede mostrar niveles variables de comportamiento social no obligatorio dependiendo de la cantidad de recursos y su crianza (Vitale, 2015). Entonces, ¿cómo se convirtió el gato doméstico en el animal de compañía tan popular que es hoy en día?, con más de 600 millones de gatos viviendo entre humanos en todo el mundo. El gato doméstico acompaña al hombre hace unos 10.000 años (Rodan, 2010), iniciando una relación de amores y desamores. Primero con un mutualismo para el control de roedores a favor del hombre primitivo, que, abandonando el nomadismo, veía amenazado el resultado de sus cosechas. Pasando luego de ser visto como un Dios para los egipcios a ser visto como una señal de mala suerte debido a su relación con brujas y demonios en la Edad Media. El gato no ha pasado desapercibido en la historia. Su propia "animalidad" hacen del felino doméstico una especie difícil de comprender para el humano, más desde la lectura antropocéntrica

o en comparación con el bien diferente “mejor amigo del hombre”, el perro doméstico. A este respecto, Galvan (2015) buscó comparar los gatos con la bien documentada capacidad de los perros domésticos (*Canis lupus familiaris*) para seguir y prestar atención a las expresiones de las emociones humanas. Custance y Mayer (2012) ya habían encontrado que los perros se acercaron e intentaron "consolar" a sus propietarios disgustados, así como a extraños, resumiendo sus resultados como una verdadera "empatía" del perro y, como un condicionamiento operante debido al posible refuerzo obtenido en el pasado por acercarse a sus dueños disgustados, de modo que aprendieron a generalizar la producción de un comportamiento "empático" a cualquier persona en espera del refuerzo. Por su parte, los gatos, aunque mostraron alteraciones en su comportamiento frente al estado de ánimo de sus propietarios, no extendieron su comportamiento positivo al experimentador desconocido, esto podría ser efecto del menor tiempo de domesticación y a su menor socialización con extraños, lo que hace que el gato promedio pudiera tener más fobia a humanos nuevos que el perro promedio (Galvan, 2015). En ese estudio, los gatos no parecieron tener respuestas particularmente positivas a los propietarios “disgustados”, pero pasaron más tiempo con sus propietarios “felices”, esto, aunque no habla de esa posible “empatía”, en el caso de los gatos si nos muestra una preferencia y una interpretación del estado de ánimo del humano. Por otra parte, aunque las comparaciones de este tipo pueden ayudarnos, deben tener en cuenta las diferencias de especie y es posible que las observaciones hayan estado sesgadas a buscar comportamientos típicos del canino que nos son más conocidos, ignorando otras señales que puede mostrar el gato. Por otra parte, puede ser importante tener en cuenta el origen de los gatos, ya que los gatos rescatados o adoptados muestran un nivel de filiación y apego hacia su humano diferente al de un gato criado desde temprana edad con ese humano, lo cual puede afectar su capacidad de interpretar y/o interesarse y reaccionar a sus estados de ánimo.

La interpretación correcta de las emociones de otro individuo es crucial para la interrelación entre ambos. Quaranta y col. (2020) realizaron con gatos los experimentos que anteriormente habían realizado con perros y caballos, para demostrar la interpretación que estos hacían de las emociones humanas. El experimento consistió en mostrar a los gatos durante una situación de tranquilidad, una fotografía de una persona o un gato, que expresaban felicidad o rabia, y simultáneamente rodar un audio con señales auditivas de las mismas emociones que podían o no tener congruencia con la imagen. Los gatos reaccionaron con mayor evidencia a la congruencia entre la imagen y

el sonido, demostrando el uso que hacen de estas señales para comunicarse y comprender una situación particular. Estos experimentos nos acercan a la comprensión de las habilidades sociocognitivas de los gatos para percibir las señales de los individuos de las especies con quien conviven, lo cual sin duda es una ventaja para el bienestar en esa convivencia. Esta habilidad social posiblemente la desarrollaron los gatos dentro del proceso de domesticación (Quaranta y col., 2020).

En 2005, Miklo´si y col. (citado por Vitale, 2015) experimentaron con perros y gatos para evaluar su capacidad de seguir señales humanas para encontrar la ubicación de una recompensa de comida oculta y para ayudarse a resolver una tarea insoluble. Los gatos siguieron con éxito los gestos humanos para obtener una recompensa; sin embargo, cuando no pudieron obtener la recompensa en la tarea insoluble, los gatos persistieron en tratar de resolverla sin dirigir la mirada al humano en busca de señales, lo que hizo sugerir que los gatos no usan al humano como recurso para obtener información y que mirar al humano no sería un comportamiento importante de comunicación. No obstante, un estudio posterior más detallado (Merola y col., 2015) sugiere que los gatos pueden interpretar bien la actitud de su propietario (positiva o negativa) hacia un artículo desconocido. El 79% de los gatos mostraron una mirada referencial entre el dueño y el objeto, y también cambiaron su comportamiento de acuerdo con el mensaje emocional dado por el dueño a través de sus expresiones faciales y comportamiento. Además, el 54% de los gatos mostraron alternancia de mirada cuando el propietario permaneció en silencio y sin reacción al objeto. Esto indica que los gatos sí buscan la referencia en su humano cuando se les presenta un estímulo desconocido, y que pueden discriminar las reacciones de sus propietarios y ajustar su comportamiento a estas. El resultado aparentemente contradictorio de estos experimentos puede deberse a la diferencia de incentivos e información que tenía el gato en cada caso. Es posible que los gatos no usen el mirar cuando esté involucrado el resolver en un problema físico, pero sí busquen referencia del humano cuando tienen miedo o dudas (Vitale, 2015). Además, la investigación ha encontrado diferencias entre las vocalizaciones de gatos de casa y ferales, indicando que la interacción con humanos influye en la comunicación vocal (Yeon y col, 2011), por lo que se requieren más estudios al respecto.

Vitale (2017a), realizó un estudio de preferencia con gatos adultos de 2 poblaciones (caseros y refugio) a los que se les dio a elegir entre: interacción social humana, comida, juguetes o aromas. Se registró la proporción de tiempo interactuando

con cada estímulo presentado por separado y luego simultáneamente. Hubo variabilidad individual en la preferencia de los gatos, pero la interacción social con los humanos fue la preferida, seguida de comida, en ambos grupos poblacionales. El estudio de la relación gato-humano desde la perspectiva del primero, es parte fundamental para entender la cognición y los niveles de consciencia felina. Se requieren más estudios para evaluar la preferencia de estímulos en diferentes ambientes y de motivación para trabajar por ese estímulo; sin embargo, se evidencia la preferencia del gato por la socialización con humanos y su habilidad para interpretar y comunicarse con estos.

Edwards y col. (2007) utilizaron una adaptación de la prueba de situación extraña de Ainsworth para examinar el apego entre gatos domésticos y sus dueños humanos, entendiendo apego como un vínculo social afiliativo y duradero formado entre un animal y un individuo específico (Ainsworth y Bell, 1970). El estudio mostró una mayor preferencia de los gatos por sus propietarios *versus* un extraño en diferentes situaciones, y la presentación de comportamientos como contacto físico, *allorubbing* (frotarse), tocar y vocalizar en compañía del dueño fueron superiores en comparación con el extraño. Incluso hubo un aumento de las conductas independientes como locomoción y exploración del área por la sola presencia del dueño en la misma sala, mostrando que los gatos se sentían más confiados en un ambiente extraño en presencia de sus propietarios, mientras que en su ausencia permanecieron más tiempo quietos y alerta. Otros estudios han mostrado el desarrollo de ansiedad por separación en gatos (ampliamente estudiada en perros). Schwartz (2002) examinó 136 gatos, durante un período de 9 años para determinar si los gatos desarrollaban signos clínicos de ansiedad por separación, encontrando conductas como micción y defecación inapropiadas, vocalización excesiva y destructividad como comportamientos de frecuente presentación en gatos ansiosos. El experimento demuestra conductas de apego del gato hacia su dueño, que incluso bajo la manifestación de un problema de conducta con efectos negativos por la ausencia del dueño, evidencian el vínculo gato-humano, lo cual es relevante para hablar de niveles de emoción y cognición.

Saito y Shinozuka (2013) demostraron que los gatos pueden reconocer y utilizar señales vocales por sí solas para distinguir entre humanos. En su estudio, los gatos debían diferenciar entre el llamado de su humano y el mismo llamado hecho por extraños, en ausencia de la presencia de estos. Se encontró que la respuesta de los gatos se manifestaba dirigiendo sus orejas, en ocasiones su cabeza, o con cambios en el tamaño de las pupilas, al reconocer la voz de sus dueños; sin embargo, no se

manifestaron con respuesta de aproximación o movimiento como se encuentra en perros. El estudio ha sido citado en artículos populares para reforzar la idea de que los gatos son ‘‘egoístas’’ e ‘‘insensibles’’ porque no responden a los llamados si no desean hacerlo (Vitale, 2015). No obstante, de nuevo debemos tener en cuenta las características particulares de la especie y lo que nos interesa es que los gatos pueden diferenciar y responder a señales auditivas; incluso puede ser muy valioso comprender cómo deciden si responder o no y con qué nivel, para acercarnos a la consciencia con que lo hacen.

Para ello es fundamental entender los órganos de los sentidos con los que conoce y se relaciona con el mundo cada especie. En comparación con el humano, los sentidos del gato son mucho más agudos, lo que los convierte en un depredador exitoso. Por ejemplo, los gatos escuchan un rango más amplio de frecuencias, incluyendo ultrasonidos, que les permiten localizar roedores. Sus orejas móviles les ayudan a localizar sonidos (Rodan, 2010). Su visión está adaptada para detectar el movimiento rápidamente, incluso bajo luz tenue. En cuanto al tacto, los gatos tienen unidades epidérmicas (células de Merkel, terminaciones de Ruffian y vibrisas) muy sensibles. Los gatos tienen un excelente sentido del olfato, con 5 a 10 veces más epitelio olfativo que los humanos, y poseen el órgano vomeronasal (órgano de Jacobson), el cual les facilita la percepción de olores que el humano no logra detectar y cumple un papel importante en la reproducción, provocando la respuesta de Flehmen (Rodan, 2010). La comunicación química es esencial para los gatos solitarios que establecen grandes rangos territoriales. Estas señales proporcionan una historia olfativa de los movimientos espaciales, el comportamiento, la salud y el estado sexual de los coespecíficos, lo que permite a los gatos obtener esta información sin contactarse físicamente con el otro individuo. Los gatos que viven socialmente participan en asociaciones no aleatorias con "asociados preferidos" (Curtis y col., 2003) y pueden usar “firmas” para distinguir entre individuos familiares y no familiares con el fin de participar en interacciones afiliativas o agonistas con estos coespecíficos (Vitale, 2017b). Estas “firmas” son sustratos biológicos (por ejemplo, feromonas en material de anidación, orina y heces) con los que los gatos recopilan información social sobre sus congéneres a través de las características químicas de estos sustratos (Vitale, 2017b).

Tradicionalmente se ha sugerido que los gatos son solitarios, pero la investigación ha mostrado que las colonias de gatos domésticos en libertad son grupos sociales más complejos que simples agregaciones aleatorias alrededor de un alimento

(Vitale, 2015). Estas relaciones parecen tener que ver con características individuales de la personalidad de cada gato, como lo demuestran Durr y Smith (1997), quienes reportan comportamientos y respuestas consistentes a pesar de los cambios en el entorno de los gatos, indicando que la estabilidad del entorno social no es crucial para mantener la estabilidad del individuo. La personalidad, según Gosling (2001), se puede definir como "esas características de los individuos que describen y explican patrones consistentes de sentimiento, pensamiento y comportamiento", en otras palabras, un estado prolongado en el que los patrones de comportamiento son relativamente consistentes en el tiempo y circunstancias, pero pueden ser influenciados dentro de la vida del animal. Otro concepto íntimamente relacionado es el temperamento, que Gosling (2001) describe como "heredado, de aparición temprana y con tendencias que continúan durante toda la vida, sirviendo como fundamento para la personalidad", y se refiere a las disposiciones biológicas del animal. Los gatos muestran consistentemente temperamento y personalidad. Diferentes autores han reportado consistencia en tres tipos de personalidad (Vitale, 2015), el primer tipo de personalidad describe un individuo sociable, seguro, sencillo, confiado y audaz que inicia interacciones amistosas. El segundo tipo de personalidad son individuos tímidos, nerviosos y "antipáticos", y la personalidad final involucra a individuos con rasgos agresivos.

Turner y col. (1986) describen que el rasgo de comportamiento de "amistad" es consistente en gatitos de 3 a 8 meses de edad, encontrando correlación entre el temperamento o personalidad de la madre y el padre y el comportamiento de los gatitos hacia los humanos. Este rasgo podría ser aprendido de la madre; sin embargo, y sin negar los elementos del aprendizaje, se encontró correlación con la paternidad, aun en gatitos que no se relacionaron con sus padres. De lo anterior, los autores deducen que existe un componente genético en la personalidad de los gatos. Se puede evidenciar la epigenética de un comportamiento aprendido ("amistad") que al ser trasmitido le hace mucho más exitoso al gato para sobrevivir como especie doméstica. Por su parte Crowell-Davis y col. (2004) describieron como en una colonia de gatos callejeros los individuos tenían asociados preferidos con los cuales preferían pasar más tiempo y tener interacciones afiliativas. Lo que demuestra que los gatos no solo pueden diferenciar a sus coespecíficos individuales dentro de una colonia, sino que también forman relaciones sociales con ciertos individuos más que con otros. Por lo tanto, los gatos son capaces de diferenciar y establecer relaciones con individuos tanto intra como interespecificamente. Estas habilidades sociales se relacionan con el nivel cognitivo, ya

que las relaciones sociales y los vínculos con otros individuos se convierten en un desafío intelectual importante al requerir de aprendizaje sobre el otro y lograr la predicción de sus comportamientos en un contexto determinado con el fin de responder adecuadamente en las interacciones sociales (Byrne & Bates, 2007).

3.2. Memoria y Razonamiento

El concepto de "cuando un objeto desaparece de la vista, continúa existiendo" propuesto por Piaget (1936), se considera un hito cognitivo importante para niños humanos y también puede ser una habilidad cognitiva importante en animales, especialmente aquellos que son cazadores expertos, como los gatos (Vitale, 2015). Si la presa desaparece detrás de un obstáculo que tapa la vista, los gatos se beneficiarían de la capacidad de recordar la ubicación de la presa antes de su desaparición. La investigación indica que los gatos pueden resolver fácilmente los problemas visuales de este tipo (Fiset y Dore, 2006); sin embargo, su memoria de trabajo pareció no ser muy larga comparada con el perro. Los gatos retenidos por un tiempo antes de permitirles buscar el objeto parecían no encontrarlo. Aquí de nuevo debemos tener presente las diferencias entre especies, los gatos se distraen más fácilmente o pierden interés más rápidamente en las actividades que un perro, o simplemente sus intereses son diferentes. Lo anterior puede deducirse del trabajo de Dumas (1992), quien modificó la prueba con una metodología más ecológicamente relevante con un objeto similar a una presa en movimiento, lo cual despertó mayor interés en la tarea que los contenedores típicamente utilizados en pruebas de desplazamiento invisible, donde, y de acuerdo a lo propuesto por Piaget (1936), el objeto desaparece dentro de un contenedor a la vista del sujeto, quien debe elegir el contenedor correcto. En el experimento de Dumas, se usaron 19 gatos, a los cuales se les puso tras un panel transparente para observar un objetivo en movimiento, pero los gatos tenían que caminar alrededor de un panel opaco para alcanzar el objeto. Mientras pasaban por el panel opaco, el objeto era escondido detrás de una de las dos pantallas existentes. Como los gatos no vieron la desaparición del objeto detrás de la pantalla de destino, el objeto quedó oculto de forma invisible. Los resultados mostraron que los gatos resolvían esta tarea con gran flexibilidad, contrastando lo observado en investigaciones anteriores. En la discusión, el autor enfatiza la diferencia entre la tarea típica piagetiana en la cual la información necesaria para tener éxito es retrospectiva, mientras que en la nueva prueba los gatos tenían que anticipar la posición actual del objeto. Esto puede entenderse desde la relevancia ecológica de esta nueva propuesta ya que, aunque la prospección puede conducir a

errores (anticipar mal la ubicación), es mucho más apegada a la realidad de un depredador como el gato, que cuando persigue una presa, esta busca escapar alejándose y/o refugiándose. En ese proceso puede cambiar de posición y volver o no a su situación original. Los depredadores deben tomar ventaja de los movimientos de una presa al anticipar nuevos lugares (Dumas, 1992). Por otro lado, la retrospección sería más eficiente para permitir la búsqueda de alimentos escondidos en una ubicación conocida. Esto demuestra una capacidad cognitiva importante al ser evaluada de acuerdo a la especie en estudio.

Whitt y col. (2009) buscaron determinar si los gatos entendían causalidad física, midiendo su habilidad para aprender a trabajar por una golosina halando una determinada cuerda horizontal. Se evaluó la capacidad de 15 gatos para recuperar una golosina, que estaba fuera de su alcance, en tres configuraciones diferentes: (a) una sola cuerda con recompensa, (b) dos cuerdas paralelas donde solo una tenía recompensa y (c) dos cuerdas cruzadas donde solo una tenía recompensa. Todos los gatos lograron tirar de la cuerda única (configuración a) para obtener la golosina, pero ninguno eligió consistentemente la cuerda correcta en las otras 2 situaciones. No hubo evidencia de que los gatos comprendieran la función de las cuerdas o su causalidad física, o podría cuestionarse la memoria a largo plazo del gato. Sin embargo, los autores concluyen que debe realizarse más investigación para examinar completamente las habilidades de los gatos en este dominio cognitivo, especialmente de nuevo, para garantizar la metodología apropiada para la especie. Los gatos pueden haber encontrado tirar de las cuerdas como algo gratificante en sí mismo, independientemente del premio. Es importante investigar habilidades cognitivas basadas en su importancia para las necesidades ecológicas y etológicas del felino.

3.3. Aprendizaje

Los gatos aprenden de sus experiencias, y podemos influir lo que un gato aprende al afectar lo que experimenta. Los comportamientos deseados pueden ser recompensados, y el comportamiento no deseado ignorado o redirigido. Sabemos que el refuerzo positivo debe ocurrir dentro de 3 segundos del comportamiento deseado; de lo contrario, el gato puede participar en otra actividad y no asociar la recompensa con el comportamiento deseado (Rodan, 2010). Se sabe también que el castigo inhibe el aprendizaje y aumenta la ansiedad. Un gato puede aprender a asociar el dolor o el miedo con el castigo, por ello el castigo nunca debe usarse con gatos. Además, la ansiedad

inhibe el aprendizaje, especialmente el aprendizaje de asociaciones positivas (Rodan, 2010).

En cuanto a la vocalización, los gatos la emplean mucho más frecuente cuando los humanos están presentes que cuando están con coespecificos, lo que probablemente refleja un proceso de aprendizaje, donde el gato sabe que recibe atención o alimento al maullar o ronronear (Turner, 2017). Generalmente, los maullidos son vocalizaciones típicas de búsqueda de atención hacia humanos y con un tono más alto y más agradable que la vocalización equivalente en los gatos salvajes y ferales (Turner, 2017). El gato puede variar los maullidos y ronroneos en diferentes situaciones y los humanos pueden interpretarlos de manera diferente, según sus propios prejuicios sobre ese sonido. Lo anterior es demostrado por McComb y col. (2009) al estudiar el uso sutil que hacen los gatos del ronroneo para solicitar comida de sus humanos, mostrando que incluso al reproducir grabaciones de ronroneos a humanos no habituados a gatos, estos percibieron una mayor urgencia en el ronroneo de solicitud de alimentos que en otros ronroneos. Así la comunicación interespecífica tiene el potencial de ser un medio eficaz para mejorar el nivel de atención o cooperación que el gato espera recibir (McComb y col., 2009).

Los gatos domésticos pueden ser inducidos a realizar numerosos comportamientos utilizando el condicionamiento tanto pavloviano como operante. Cada vez más la investigación de la cognición del gato proporciona evidencia de sus complejas habilidades socio-cognitivas y de resolución de problemas (Vitale, 2017a). No obstante, todavía existe la creencia común de que los gatos no son especialmente sociables o entrenables. Esta desconexión puede deberse, en parte, a la falta de conocimiento de qué estímulos prefieren los gatos y, por lo tanto, pueden estar más motivados para trabajar por su obtención. Los gatos también pueden aprender a través de observaciones, en un estudio Norton (1974) (citado por Vitale, 2018) mostró como gatitos aprendieron a presionar una palanca en presencia de una luz, para recibir una recompensa de comida, y esto lo aprendieron observando a sus madres o a otro gato adulto, siendo más rápido el aprendizaje en el primer caso. Por otro lado, gatitos que no observaron ni a su madre ni a otro gato adulto (se les dejó participar por ensayo y error), adquirieron la competencia, pero nunca con la misma tasa de éxito que los que aprendieron por observación. Por su parte, los hallazgos presentados por Sherman y col. (2013), confirman que los gatos pudieron ser entrenados con éxito en un laberinto en T adaptado, que combinó componentes motores y cognitivos. En ese estudio 18 gatos

fueron entrenados con éxito para superar el laberinto obteniendo recompensas positivas de alimento.

4. DISCUSIÓN GENERAL Y CONCLUSIONES

En los últimos años se ha incrementado el interés por la investigación en felinos, lo cual es, no solo fundamental para la comprensión de la especie, si no para mejorar tanto el bienestar de los gatos como el de los humanos, dado el incremento en la popularidad de estos como mascotas en todo el mundo. Sin embargo, aún falta mucho por estudiar y comprender de esta especie. El fascinante estudio de la mente humana y animal, como ente intangible, del cual solo podemos tener evidencia a través de sus capacidades y expresiones, es un mundo por explorar en el gato doméstico; no obstante, tenemos ya suficientes luces que nos permiten dilucidar esa incógnita y dar respuesta a las preguntas propuestas sobre si tienen los gatos capacidades cognitivas, si pueden sentir, aprender y recordar. A pesar de que muchos de los estudios aquí citados no son concluyentes, sí tienen hallazgos con implicaciones prácticas para evaluar y mejorar el bienestar del gato y la relación humano-gato.

Hasta ahora la comunidad científica está comenzando a estudiar y comprender la cognición del gato doméstico. Vitale (2018) define cognición felina como una amplia gama de experiencias felinas que son parte del comportamiento, incluyendo la detección, percepción, aprendizaje, recordar y razonar. Por su parte el profesor Broom (2014), reconocido mundialmente por su trabajo en bienestar animal y sintiencia, propone que es más probable que a un animal se le considere sintiente si este puede aprender, aprende rápido y comete menos errores después de aprender. Varios de los estudios descritos en esta revisión nos muestran la capacidad del gato para aprender, hacerlo rápido y modificar su conducta tras este aprendizaje, lo que nos permite además suponer algún grado de consciencia. Otros estudios no concluyentes en esta área deben ser revisados en su metodología para hacerla ecológicamente relevante para los gatos. Este es un elemento clave ya que se debe comprender que la mente, como muchas otras características, son especie-específicas. La mente del gato es única, por tanto, hay que estudiarla desde la perspectiva de este, entendiendo lo que es relevante para la especie.

Hay otros estudios recientes que, aunque tampoco son aún concluyentes, pueden tener implicaciones prácticas para la evaluación del bienestar del gato y la comprensión de sus emociones, como el de Dawson y col. (2019), que buscó llegar a comprender las expresiones faciales felinas. Estas últimas son útiles herramientas para identificar

estados afectivos en otras especies; en el gato esto podría ayudar a proporcionar mejores cuidados y comprender mejor sus emociones, fortaleciendo el vínculo humano-gato. Investigar más a fondo y con mayor exactitud cuáles son las expresiones faciales del gato y su significado también permitiría dar respuesta a preguntas cómo ¿son los gatos más expresivos en presencia de humanos que le son familiares o con los que tiene alguna relación?, teniendo en cuenta que parece que los gatos son empáticos con sus humanos familiares, lo que vendría a reforzar que tienen emociones y son capaces de decidir su emoción en contexto.

La investigación cognitiva realizada en gatos incluye percepción, permanencia de objetos, memoria, causalidad física, cantidad y discriminación de tiempo, sensibilidad de los gatos a las señales humanas, reconocimiento vocal y comunicación, vínculos de apego, personalidad, y salud cognitiva (Vitale, 2015), demostrándose en todos los casos la habilidad del gato en estas áreas. Pero no debe perderse de vista la necesidad de usar metodologías e interpretar resultados dentro del contexto de la especie, es decir desde esa "gaticidad del gato", por ejemplo, se evidencia que los gatos no buscaran la ayuda de su humano para resolver tareas que involucren problemas físicos, como lo hace un perro; sin embargo, frente a la presentación de un estímulo nuevo y ambiguo si utilizarán como referencia al humano mirando su comportamiento.

Con el crecimiento de la población de gatos domésticos, no es extraño que se estén realizando cada vez más investigaciones sobre su cognición; no obstante, todavía queda mucho por aprender sobre cómo los gatos perciben, aprenden y toman decisiones sobre esos aprendizajes. La domesticación altera el comportamiento de una especie y le reta a desarrollar más y mejores habilidades para tener éxito en sus nuevas condiciones. Debe estudiarse más cómo influye la vida social o solitaria sobre la cognición, para entender mejor al gato como miembro de la familia multiespecie, ya que como se mostró, los gatos son capaces de diferenciar y establecer relaciones con individuos tanto intra- como inter-especie.

La capacidad de interpretar las emociones de otros individuos tiene un rol importante en los individuos sociales. Como vimos los gatos mantienen relaciones sociales con individuos de la misma especie y con humanos. Varios estudios han demostrado la capacidad de los gatos para integrar señales visuales y auditivas, para reconocer humanos y coespecíficos, reaccionar a las señales comunicativas humanas y coespecíficas, modulando su comportamiento de acuerdo con la valencia de la emoción que experimentan, lo que demuestra consciencia y procesamiento de la información

para aprender de ella y dar una respuesta emocional, esto es lo que evidencia la mente en cualquier especie.

De acuerdo a toda la evidencia encontrada, el gato doméstico (*Felis silvestris catus*), es capaz de sentir, aprender, recordar, actuar y modificar su conducta de acuerdo a las experiencias vividas, así como reconocer y reconocerse. Estos elementos demuestran la mente y las características de la mente en esta especie y por tanto su presencia. Continuar investigando en estas áreas usando metodologías ecológicamente relevantes para la especie, llevará a mejores conclusiones que beneficien su bienestar. Toda esta información sería beneficiosa para las personas que estén considerando la adquisición de un gato nuevo, posiblemente ayudando a reducir la diferencia entre las expectativas del dueño y el comportamiento del gato, llevando así a relaciones más exitosas, menos abandonos y mayor bienestar. El concepto de "Un Bienestar" ("*One Welfare*"), el cual está enfocado en estrategias para mejorar el bienestar humano y animal (García Pinillos y col. 2016), y de familias multiespecie, toman cada vez mayor relevancia en la relación humano-gato para el bienestar de ambos, por lo tanto, se recomienda seguir investigando sobre la mente del gato, utilizando un mayor número de sujetos y metodologías diseñadas o adaptadas al comportamiento natural del gato, y sus implicaciones sobre las relaciones entre individuos (gatos y humanos), las mejoras del ambiente de tenencia de los gatos domésticos, los recursos que se les proveen para que expresen comportamientos naturales siempre con el objetivo de mejorar su bienestar y su calidad de vida a corto y largo plazo.

5. RECOMENDACIONES

La mente felina sigue siendo una incógnita, y aunque se ha iniciado un camino importante en su comprensión, falta mucho por recorrer para responder preguntas que ayudarán al bienestar de la especie y a su relación con el humano. Sabemos que los gatos pueden modificar su conducta para lograr una mejor comunicación con nosotros, pero ¿hasta qué punto lo hacen y cómo podemos responderles? Se ha probado una importante capacidad cognitiva en la especie, pero ¿hay diferencias cognitivas entre grupos de gatos (salvajes, ferales, refugio, mascota)? La investigación siguiente debería encaminarse a responder preguntas que contribuyan a nuestra comprensión científica de cómo la domesticación, el vínculo con el humano y la adaptación de un el estilo de vida solitario a uno social influyen en la cognición del gato.

Existe aún debate sobre el bienestar del gato de interiores frente al gato en libertad y al gato que se le permite salir de casa libremente. Los argumentos a favor de permitirles la salida se basan en la esfera de la naturalidad y por supuesto tocan también la mental; el comportamiento natural de un felino es predador y exploratorio; salir, cazar y explorar, son entre otros, comportamientos que el gato de interior no puede realizar y que puede pensarse van en contra de su bienestar. Por su parte el gato de interior no está expuesto a graves enfermedades virales y parasitarias, ataques de otros animales, ni a perderse, lo cual también es parte de su bienestar y la de su propietario. Debemos aprender mucho más sobre el gato en libertad y su comportamiento, deben desarrollarse observaciones que nos permitan saber cómo percibe el gato los espacios humanos y así poder hacer una mejor gestión de los espacios en que conviven con nosotros permitiendo un mayor bienestar del gato de interiores; proveyéndole del enriquecimiento ambiental y nutricional que puedan suplir su necesidad de salir.

Por otro lado, los hallazgos demuestran que los gatos han desarrollado habilidades sociales que les permiten comprender las señales emocionales humanas, factor clave para fortalecer el vínculo humano-gato; ahora bien, sería importante desarrollar estudios que nos permitan comprender las diferentes señales que han desarrollado para comunicarse con nosotros.

Aunque falta mucho por comprender, la literatura actual ha proporcionado una sólida base para futuras investigaciones. El creciente interés de la comunidad científica en este tema, con consideraciones especie específicas y metodologías apropiadas, es probable que nos permita aprender mucho más sobre la cognición del gato en los próximos años.

NO.01/2022

BUDGET

Budget to :
Kevin Patrick Kostello
Customer's email:
kevinpatrick.costello@urv.cat
TIN: xxx xxx xxx
Direction: Tarragona

From :
Marianna Georgiou Barmpouti
Translator
TIN:166108402
Direction: Chrisostomou Smirnis 137
Petroupolis, Athens: 13231
Telephone number:6989516351
marianna.barmpouti@estudiants@urv.cat

Project	**Translation Spanish>English**
Client	Kevin Patrick Kostello
Contact person	Kevin Patrick Kostello
Number of Words	10.000
Price per word	0.10-0.12 euros/word
Price range*	750-1200 euros
Repetitions (+50%)	50% discount
Similarities (+75%)	75% discount

Submission date: 14 days from order confirmation
Payment terms: 30 days from the invoice date, by bank transfer
Observations: Base price, excluding taxes. The translation will be sent in PDF form.
Bank account: 3439325020003334
Order acceptance: Yes / No

Notes

*In scientific/academic texts my general prices are between 0,10-0,12 euros per word, depending on the difficulty of the text. I also offer discounts for repetitions or similarities within the text. Thus, the final price will range from 750 to 1200 euros.

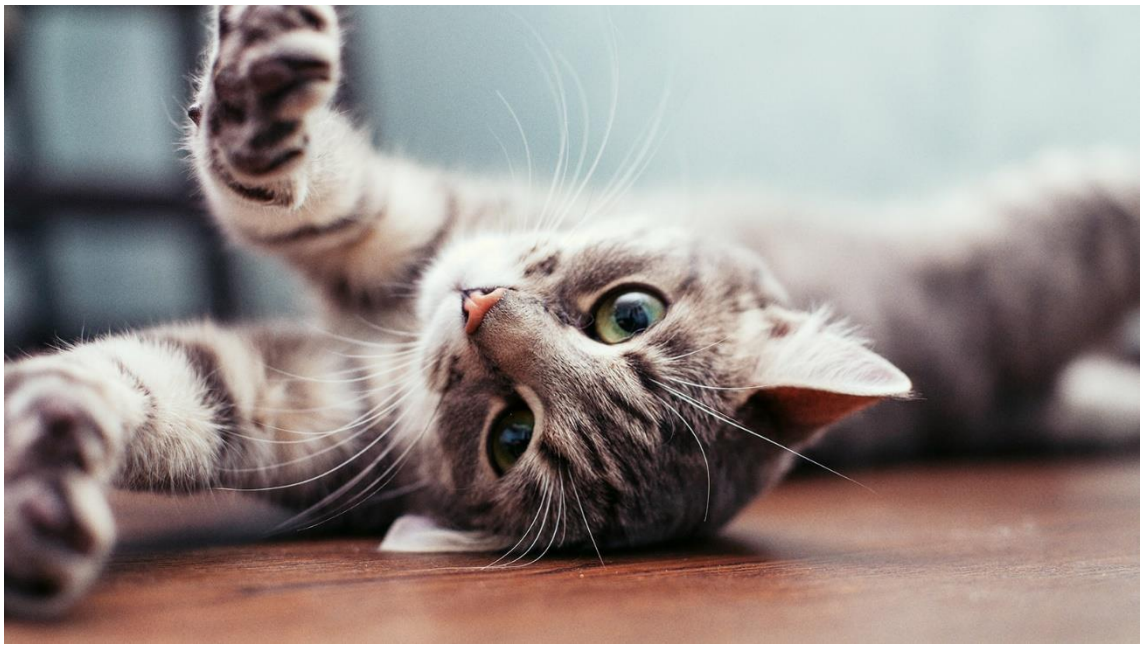
Date and signature of the order acceptance:

Thank you for choosing us!

Sender:
Marianna Barmpouti

TRANSLATION OF THE ORIGINAL TEXT

The Mind of the Domestic Cat (*Felis Silvestris Catus)*



PREAMBLE

Although cats have a reputation for being independent and not very attached to their caregivers, they can make excellent home companions. They can be as affectionate as dogs, but have considerable differences, and not only physical ones. Therefore, it is essential to know the character, behaviour and needs, or in other words all the characteristics of a cat, before adopting one.

Cats have many qualities. Intelligent, elegant and agile are just some of the adjectives we can use to label this feline that has adapted to coexist with humans, and to live both indoors and outdoors in cities (where they often form colonies). Cats first got close to people around 10,000 years ago, attracted by the abundance of rodents that roamed in human settlements. Soon, these people realized cats' value in controlling pests. Eventually, in civilizations such as ancient Egypt, cats were revered as sacred animals (even gods), and so respected as to be buried with honours.

Throughout the years, the relationship between cats and humans has experienced various ups and downs, but felines have always managed to adapt to every situation in order to survive.

Cats are quadruped mammals with whiskers (which are modified hairs with a sensitive function), retractable claws, hair covering their entire body, and a tail (though the Manx cat lacks the latter trait). Their 230 bones allow them great flexibility and elasticity. In addition, cats' colouration varies greatly, and can be monocolour, bicolour or tricolour, with different patterns and lengths of stripes. Although there are variations between larger and smaller specimens and breeds, the average weight is between three and five kilogrammes.

Furthermore, cats are viviparous animals. This means that they give birth to live young in litters of about four to five kittens, which will feed on their mother's milk during their first weeks of life. Cats' sense of sight, hearing and smell also stand out, facilitating their life as predatory animals. Their normal body temperature is between 38 and 39 ºC.

Cats are mostly strict carnivores. Their diet in the wild was based on rodents, birds and lizards. However, it is not uncommon for them to occasionally eat plants, presumably to supplement their diet.

Among cats' characteristics, their personality stands out – although we will find considerable variations depending on the individual and the events it has experienced throughout its life. We can also highlight their various modes of communication, including body language and sounds such as meowing, hissing and purring. Another important form of communication is through the pheromones they emit.

Cats, except female cats and their litters, are mostly solitary. Although they can live in colonies or collectives, this can be a stressful situation for them and can manifest in ways such as inappropriate elimination, fights, and decreased appetite. They love routines, so any changes should be made after a period of adaptation. Unlike dogs, they do not need to learn basic commands. However, cat owners should establish rules of coexistence, and dedicate time to play and give attention to their pets.

ABSTRACT

The science of animal welfare has been researched extensively in the spheres of physical health and behavioural expression (naturalness). However, the mental sphere offers greater complexity and in this area there have been fewer studies, despite it being one of the three fundamental pillars of animal welfare. Cats have become the favoured pet in much of the world. However, there is a lack of research on this species, and understanding the feline mind is essential to provide adequate welfare conditions. In addition, there is a bidirectional relationship between cognition and welfare. This is a species that requires enriched environments that are complex and stimulating. This review describes the various investigations that have tried to understand the mind of the domestic cat (*Felis silvestris catus*). It includes cognitive research conducted on cats that demonstrates the ability of cats in the areas of perception, object permanence, memory, physical causality, quantity and time discrimination, sensitivity to human signals, vocal recognition and communication, attachment bonds, personality, and cognitive health. Studies in cognition have demonstrated cats' ability to learn and to quickly modify their behaviour after learning. This allows us to assume some degree of consciousness. Cats' sentience is demonstrated by their ability to experience negative (fear and pain) and positive (joy and 'friendship') emotions. The cat's mind is unique, meaning it is extremely important to use specific methods and to interpret results in the context of the species. We can conclude that scientific research to date demonstrates the sentience and cognitive capabilities of domestic cats. This opens the window for further research on the feline mind, which could lead to maximizing cats' level of welfare and cats being granted the protection they deserve.

Keywords:

Feline, mind, welfare, cognition, sentience

INTRODUCTION

The areas of animal welfare (physical, mental, and behavioural; Fraser, 2008) are recognized as interrelated and interdependent. However, there has been far more scientific study in the physical and behavioural spheres, probably due to their greater accessibility. Meanwhile, the mind remains an unknown, even in human animals, while its study in non-human animals has been underway for only a few decades. Nevertheless, the study of the mind is one of the science of animal welfare's three fundamental pillars.

The human brain weighs approximately 1.4 kg, is composed of around 100,000,000,000 interconnected neurons, and is the organ that makes humans capable of reflecting on both their own nature and that of the universe. According to Professor Aznar (n.d.) of the University of Barcelona's Faculty of Psychology, animals' brains are the main organ regulating each species' survival.

The brain internally represents sensory information in cognitive maps (neural patterns) in a symbolic manner (cognitively). Cognitive maps can be classified as interoceptive, proprioceptive, and exteroceptive; these provide information about the state of viscera, the musculoskeletal system, and the external world, respectively (Aznar, n.d.). Cognitive maps are essential in the configuration of an animal's mind which "observes and observes itself", making each animal's mind "genuine, personal and non-transferable" (Aznar, n.d.). Through these maps, the mind constructs a representation of the outside world and assembles a consistent response. Subsequently, the maps remain in memory, and can be retrieved through imaginative recall to plan and build better responses (Aznar, n.d.). Is it possible that non-human animals, including cats, do the same thing?

According to Ribes (2000), the mind is a non-spatial entity that functionally cohabits with the physical and is experienced individually. The architecture of the mind is made up, among other elements, of memory, thought, imagination, attention, and consciousness (Ribes, 2000). Therefore, demonstrating some of these characteristics in cats could help to define their mind.

The human mind is studied in psychology through the theory of mind. According to García García (2008), "thanks to the theory of mind people communicate, interact, produce and transmit culture". Tirapu et al. (2007) state that the theory of mind refers to the ability to understand and predict other people's behaviour, knowledge, intentions,

emotions, and beliefs. Thus, human beings have mental capacities that allow them to interpret and predict the behaviour of others. Do cats have the same abilities?

Artificial intelligence is among the biggest trends and challenges of the modern world. Developing algorithms that make machines 'intelligent' requires specific decision-making models. To formulate an artificial intelligence algorithm the feline mind has been used (Cat Swarm Optimization – CSO) (Chu, 2007). This models cat behaviours in the hope of solving mathematical optimisation problems (selection of the best option, regarding certain criteria, from a set of available elements). Even when they are resting, cats have a very high level of alertness, which caught the engineers' attention. Therefore, two of cats' main behavioural traits are modelled for the proposed optimisation. These traits are called 'Search Mode' and 'Tracking Mode' Combining these two modes allows CSO to perform better. Chu (2007) indicated that in the proposed algorithm they used "cats and the cat behaviour model to solve optimisation problems, that is, we used cats to represent solution sets". I will not try to describe the engineering details, but it is at least interesting for the discussion that the feline mind is considered for a model like this: it implies that observing cats and their behaviour is relevant for decision-making processes. Does this testify to the feline mind and its cognition?

The scientific study of consciousness seeks to explain a range of psychological processes, such as the integration of information, the focus of attention, the deliberate control of behaviour, the ability of a system to access its own internal states, and the ability to report on its own mental state (Chambliss, 2018). Consciousness is thus a capacity to recognize oneself, and perceive and act in the world. The phenomenon of the animal mind not only causes great curiosity in the scientific world at present, but its study could be decisive to whether there is such a consciousness behind what different species learn and feel. This would be a great advance in the understanding and defence of non-human animals, and the science of animal welfare; moreover, it would not only prove that feeling is a biochemical and neurological process, but also that suffering and other emotions (both positive and negative) are mental states. Mental activities include perceiving, remembering, attending, and thinking. The mind ultimately constructs and reconstructs the world from sensations and its contact with the real world (Ribes, 2000). Perhaps there is still a long way to go to obtain exact conclusions. However, research results on cognition, decision making, reasoning, and the psyche (among others) are beginning to provide clues about the phenomenon of the animal mind.

Currently, domestic cats are the most popular pet in much of the world. However, when it comes to the mind, they are possibly the domestic species on which the fewest studies have been conducted. The current paper describes the studies that to date have sought to understand the mind of the domestic cat (*Felis silvestris catus*) in order to answer questions such as: do cats have cognitive abilities? Specifically, can they sense, learn, remember, and modify their behaviour according to previous experiences? This review begins by addressing sentience and domestic cats' ability to feel emotions, such as pain and fear. I then review the literature on consciousness in general, and what can be inferred about that of the cat. Finally, I discuss the literature showing the different cognitive abilities possessed by domestic cats. Whenever possible, recommendations for future research and considerations for improving cat welfare are included.

1. SENTIENCE

A movement around animal welfare began with Jeremy Bentham (18–19th century AD), father of utilitarianism, and his postulate on the importance of whether animals can feel, rather than whether they can think or speak. This has shaped the development of the term 'sentience', understood as the ability to feel both pleasant and negative emotions (FAWC, 2014). Today, two centuries later, it should not be challenging to prove sentience in any species, at least in higher vertebrates. This is due to advances in neurophysiology and general medicine, which have discovered neural circuits, and the biochemistry of pain and sensation. Currently, sentience is defined as having the consciousness and cognitive capacity necessary to have feelings (Broom, 2014). Of course, we can understand the complexity of demonstrating the consciousness, the suffering, and even the metacognition of individual animals. Broom (2014) proposes that an animal is more likely to be considered sentient if it can learn, learn quickly, and make fewer mistakes after learning. This should imply some degree of consciousness. From here we will begin our journey to elucidate the mind and cognition of the domestic cat.

Cats can experience sensations of pain, fear, and discomfort. Human-like neural circuits for these sensations exist, and studies such as that of Moody et al. (2018) show how cats exhibit negative sympathetic-type responses, such as pupillary dilation and increased respiratory rate to aversive manipulation. These physiological indicators of well-being, associated with stress, are evidence of mental emotions with negative valence. They demonstrate cats' capacity to feel pain and fear when they face being

handled in the veterinary clinic in a way that is aversive to them. The same study showed behavioural responses such as licking, changes in posture and the positioning of ears that depended on the type of manipulation (aversive or gentle) and the cat's temperament (friendly or hostile). Behavioural indicators of well-being, such as those mentioned above, are also used to demonstrate the valence (positive or negative) of emotions experienced by the animal. Behaviour and posture are likewise indicators of the animal's emotion in response to its handling (Yeates, 2016). This is particularly important for cats, given how critical the animal's level of stress can be for cats and their human handlers. For this reason, nowadays there is talk of providing 'friendly' experiences for cats during their handling, and their whole experience of veterinary care (Rodan et al., 2011). This is applicable even in a cat's own environment, as reported by Rodan et al. (2011), who state that different environmental management techniques and non-aversive handling can generate less stress in cats.

Cat temperament has been demonstrated as strongly related to motor laterality (preferential use of one front leg). Also, the presence or absence of lateralisation is directly related to the expression of emotion, independent of the direction of the lateralised bias. Specifically, during foraging and temperament tests, cats classified as ambilateral tended to respond in a more fearful manner. In contrast, cats that had preferential lateralisation (preferred use of either their left or right paw, but not both) were more confident animals. These results were aligned with the owners' perceptions of each cat's personality. Ambilateral cats were categorized by their owners as more aggressive, while also less affectionate, obedient, and friendly. On the other hand, cats with lateral preference were described by their owners as friendly and affectionate animals. The description of temperaments in this study, which will be discussed later, and their association with laterality is very interesting. The fact that there are behavioural tendencies according to the presence or absence of lateral bias shows the use of different anatomical regions and brain hemispheres. Moreover, the owners' description of their cat's personality provides evidence for the presence of emotions, in a manner corresponding to the test results (McDowell et al., 2016).

Sex has also been identified as a factor associated with laterality in cats. Wells and McDowell (2019) report that males prefer using their left paw, while females prefer using the right. These researchers sought to understand the relationship between laterality and breed, to connect personalities and temperaments with those two elements. Their results are consistent with the emotional valence theory of laterality, which has

been studied by Quaranta et al. (2007) regarding tail movement in dogs. This study showed the difference in the asymmetry and amplitude of dog tail movements, depending on the emotions caused by different visual stimuli. Regarding cats, a relationship between laterality and feline breeds prone to reactive behaviours and emotions was demonstrated. This showed different patterns of paw use in breeds of cats with less reactive temperaments. Although complete concordance was not found in such dispositions, the door is open to further studies that can determine these relationships. This could provide a reference to recognise temperaments and facilitate choosing a pet, thus improving the human-cat relationship and the welfare of both.

The next step is to investigate what positive and pleasurable emotions a cat can experience. Animal well-being today is understood not only as avoiding negative emotions, but also as providing positive emotional experiences. Can a cat experience pleasure or joy? Fermo et al. (2019) sought to identify vocalisations other than meowing (cats are among the most vocal species), in relation to a pleasant and an unpleasant experience. For this purpose, they used a group of 74 cats divided into two groups. Only the group exposed to a positive experience (a favourite snack) produced specific vocalisations other than meowing, such as trilling, squeaking, purring, and chattering. In contrast, during the aversive situation (vehicle transport), no vocalisation other than meowing was observed. In their results, the authors report on the relevance of studying vocalizations to determine the state of emotional valence in cats.

2. CONSCIOUSNESS

The understanding of consciousness and the mind in humans and other species remains an unknown under investigation. Therefore, we should not base the science of animal welfare on the assumption that we understand consciousness or can decide which species are or are not conscious. Animal welfare is too important to wait until the problem of consciousness has been solved (Dawkins, 2017). However, animal welfare may benefit from understanding that if animals can reason and are capable of cognitive processes, they can then have consciousness, awareness of their emotions, and awareness of what they feel. This would therefore have wide implications for our responsibility in the treatment of non-human animals. Despite the difficulties of studying animal consciousness, we must not abandon the quest to understand the problem of the relationship between the brain and experience in different species. In cats, there is greater difficulty due to little information and few studies on the subject.

However, we must take the opportunity to face the difficulties in an objective way. This includes reviewing the available information, investigating the behavioural mechanisms and trying to deduce whether they involve conscious pathways, and avoiding the pressure of whether it is relevant to animal welfare.

The Cambridge Statement on Consciousness (Low, 2012) concludes that non-human animals, "including all mammals and birds, and many other creatures, including octopuses", have consciousness. This was concluded by a prominent international group of neuroscientists, neuropharmacologists, neurophysiologists, neuroanatomists, and computational neuroscientists after examining the neurobiological substrates of conscious experience and related behaviours in humans and non-human animals. Cats, as mammals, are included in this consideration, as they possess the neurological substrates that generate consciousness. However, more specific feline studies are required in this area.

Additionally, we should consider that to approach the mind of another species we must understand how it comprehends, knows and responds. In other words, we must try to understand the unique qualities of the species and try to "see through its eyes", or what Rollin (2017) would call, understand the "*Catness of the cat*". This draws attention to the need to study and understand the cat in terms of what it is – a cat. Indeed, if cats are compared to dogs, the latter are social beings and are very likely to recognize their human family as their 'pack', whereas cats remain individual beings despite being able to live in communities under certain circumstances. Therefore, perhaps we cannot expect cats to show the same type of 'empathic' response that has been observed in dogs. If we understand the empathic individual as one who has "the ability to understand and share the feelings of another individual" (Cambridge Dictionary), the absence of an empathic response would not necessarily imply the absence of awareness of another's state. In the chapter on perception, we will review evidence of cats' discriminatory ability to be empathetic to their owner, but not to strangers. We will also discuss dogs' general empathy towards humans, which may also be related to their domestication time.

Studies on humans have shown that people can respond emotionally to a face very differently. Their response depends on whether that face shows a happy, sad, or angry expression – even when they are not consciously aware of having seen a face (Dimberg et al., 2002). According to Dimberg et al. (2002), our ability to interpret the emotional expression of a human face may be unconscious. A stimulus through the right

hemisphere quickly reaches the amygdala via a subcortical pathway, a route distant from the cortical pathways associated with consciousness, more like the processing of threat stimuli. Here, the key point is that humans have different ways of processing information and generating a wide range of behaviours, some of which involve consciousness and some of which do not. Therefore, we should be cautious about drawing conclusions from observations in cats, especially given the differences between species. For example, in primates and rodents there is a difference between the route of experiencing a taste and how pleasant it is. While the former experience it in the cortex, in rodents the taste pathways are wired differently, with subcortical connections bypassing the cortex altogether and making connections directly to the hypothalamus and amygdala. Thus, even though both can do taste learning, we could be uncertain about taste consciousness in rodents (Rolls, 2013). Or could it be that conscious pathways are different between species? Similar studies in cats are discussed in the chapter on cognition.

Recognising the difficulty in describing consciousness, we can approach the problem from the perspective of cognition. Regardless of the level of consciousness, it is clear that animals have the ability to receive, process and retain information through the senses, and decide to act accordingly (Broom, 2014). Research on the cognition of cats may then give us some clues.

3. COGNITION

Although millions of cats live with humans worldwide, the scientific community is only now beginning to study and understand cats' cognition and behaviour (Vitale, 2017b). The most widely accepted definition of cognition was provided by developmental psychology: the mental actions or processes that enable acquiring, processing, storing and using information (Shettleworth, 2010). Vitale (2018) defines feline cognition as a broad range of feline experiences that are part of behaviour. These include sensing, perceiving, learning, recalling, and reasoning.

3.1. Perception

Perception is the process by which an individual becomes aware of stimuli in the environment through their senses (Vitale, 2018). At first glance, no member of the Felidae family would be a likely companion for humans. Most felines lead solitary lives and engage in social behaviour only for breeding and child-rearing. The only Felidae that coexist in social groups are lions *(Panthera leo*), cheetahs *(Acinonyx jubatus*), and

occasionally, domestic cats *(Felis silvestris catus*) – which may show varying levels of non-compulsory social behaviour depending on the available resources and how they were raised (Vitale, 2015). So, with more than 600 million cats living among humans worldwide, how did the domestic cat become the popular companion animal it is today? The domestic cat has been with humans for about 10,000 years (Rodan, 2010), during which a love-hate relationship has developed. First, a mutually beneficial rodent control system existed. This favoured primitive humans, who after abandoning nomadic life saw their harvest yields being threatened. Cats then went from being seen as gods by the Egyptians to being seen as signs of bad luck, due to their relationship with witches and demons in the Middle Ages. The cat has not gone through history unnoticed. Its own 'animality' makes the domestic feline difficult to understand for humans. This is especially the case from an anthropocentric reading, or in comparison with the very different 'man's best friend' – the domestic dog. In this regard, Galvan (2015) sought to compare cats to domestic dogs' *(Canis lupus familiaris*) well-documented ability to track and pay attention to expressions of human emotion. Custance and Mayer (2012) had already found that dogs approached and attempted to 'comfort' their disgruntled owners as well as strangers, summarizing their results as true dog 'empathy'. This was seen as operant conditioning due to possible reinforcement obtained in the past by dogs approaching their disgruntled owners. Therefore, they learned to generalize the production of 'empathetic' behaviour to anyone, in expectation of reinforcement. However, although cats showed alterations in their behaviour according to the mood of their owners, they did not extend their positive behaviour to unknown experimenters. This could be an effect of cats' shorter domestication time and less socialization with strangers, which makes the average cat more phobic to new humans than the average dog (Galvan, 2015). In that study, cats did not seem to have particularly positive responses to 'upset' owners, but spent more time with their 'happy' owners. Although this does not directly imply possible 'empathy' in cats, it does demonstrate preference and interpretation of their owner's mood. Nonetheless, although comparisons of this type can help us, we must consider species differences. It is possible that these observations have been biased to look for typical canine behaviours that are more familiar to us, while ignoring other signs that cats may show. Furthermore, it may be important to consider the cats' origin. Rescued or adopted cats show a different level of affiliation and attachment to their owner than a cat raised from an early age with that

human. This may affect their ability to interpret and/or be interested in and react to their owner's moods.

Correctly interpreting another individual's emotions is crucial in an interrelationship. Quaranta et al. (2020) conducted the same experiments with cats they had previously carried out with dogs and horses to interpret human emotions. The experiment consisted of showing the cats – in a quiet situation – a photograph of a person or a cat expressing happiness or anger. Simultaneously, they played audio with signals of the same emotions that may or may not be congruent with the image. Cats reacted more intensely to the congruence between image and sound, demonstrating their use of these signals to communicate and understand a particular situation. These experiments help us understand the social-cognitive abilities of cats. Undoubtedly, this is an advantage for the well-being of the cat-human coexistence, as through these experiments the cats perceive the signals of individuals with whom they live. Cats possibly developed this social skill within the domestication process (Quaranta et al., 2020).

In 2005, Miklósi et al. (cited by Vitale, 2015) carried out experiments with dogs and cats, assessing their ability to follow human signals to find the location of a hidden food reward and to solve an unsolvable task. Cats successfully followed human gestures to earn a reward. However, when they could not earn the reward for the unsolvable task, cats persisted in trying to solve it without looking at the human for signals. This suggested that cats do not use the human as a resource to obtain information and that looking at the human would not be an important communicative behaviour. However, a more detailed later study (Merola et al., 2015) suggests that cats may interpret their owner's attitude (positive or negative) towards an unknown object well. Most cats (79%) exhibited referential looking between the owner and the object and changed their behaviour in line with the emotional message given by the owner's facial expressions and behaviour. In addition, 54% of the cats showed gaze alternation when the owner remained silent and did not react to the object. This indicates that cats do look for reference in their owner when they are presented with an unknown stimulus. It also reveals that they can differentiate between the reactions of their owners and adjust their behaviour accordingly. The apparently contradictory results of these experiments may be attributed to the difference in incentives and information that the cat had in each case. Cats may not use looking when involved in solving a physical problem, but they do seek reference from humans when they are afraid or in doubt (Vitale, 2015). In

addition, research has found differences between the vocalisations of house and feral cats, indicating that human interaction influences vocal communication (Yeon et al, 2011). Thus, further studies are needed on that matter.

Vitale (2017a) carried out a preference study with adult cats from two populations (pet and shelter). She gave cats a choice between human social interaction, food, toys or scent. In this study, the proportion of time interacting with each stimulus – presented separately and then simultaneously – was recorded. In both populations, cats' individual preferences varied, but social interaction with humans was the most preferred stimulus, followed by food. The study of the cat-human relationship from the perspective of the former is a fundamental part of understanding cognition and the levels of feline consciousness. More studies are needed to evaluate the preference for stimuli in different environments and the motivation to work for that stimulus. However, the cat's preference for socialisation with humans and its ability to interpret and communicate with them is evident.

Edwards et al. (2007) used an adaptation of the Ainsworth Strange Situation Test to examine attachment between domestic cats and their owners. In this adaptation, attachment is understood as an affiliative and lasting social bond formed between an animal and a specific individual (Ainsworth and Bell, 1970). The study showed cats' greater preference for their owners versus a stranger in different situations. Additionally, behaviours such as physical contact, rubbing, touching, and vocalising were higher in the company of the owner compared to the stranger. There was even an increase in independent behaviours, such as locomotion and exploration of the area, due to the mere presence of the owner in the same room. This showed that the cats felt more confident in an unfamiliar environment in the presence of their owners, while in their absence they remained more quiet and alert. Other studies have shown the development of separation anxiety in cats (extensively studied in dogs). Schwartz (2002) examined 136 cats over a period of nine years to determine whether cats developed clinical signs of separation anxiety. She found that behaviours such as inappropriate urination and defecation, excessive vocalisation, and destructiveness frequently occur in anxious cats. The experiment demonstrates the cat's attachment behaviours towards its owner. Even when the owner's absence causes behaviour problems to the cat with negative effects, these behaviours highlight the cat-human bond, which is relevant when talking about levels of emotion and cognition.

Saito and Shinozuka (2013) demonstrated that cats can recognise and use vocal signals alone to distinguish between humans. In their study, the cats had to differentiate between the call of their owner and the same call made by strangers, without their physical presence. The study revealed that cats responded by moving their ears (and sometimes their head) or changing the size of their pupils when recognising the voice of their owners; however, unlike dogs, they did not respond by approaching or moving towards their owners. The study has been cited in popular articles to reinforce the idea that cats are 'selfish' and 'insensitive' because they do not respond to calls if they do not wish to do so (Vitale, 2015). However, again we must consider the particular characteristics of the species and the most interesting fact is that cats can differentiate and respond to auditory signals; it could even be valuable to understand how they decide whether or not to respond and at what level, to bring us closer to comprehending the consciousness with which they act.

To do this, it is essential to understand the sense organs with which each species knows and relates to the world. Compared to humans, cats' senses are much sharper, making them successful predators. For example, cats hear a wider range of frequencies, including ultrasounds that allow them to locate rodents. Their mobile ears help them locate sounds (Rodan, 2010). Their vision is adapted to detect motion quickly, even in dim light. As for touch, cats have very sensitive epidermal units (Merkel cells, Ruffini endings and whiskers). Cats also have an excellent sense of smell, with five to ten times more olfactory epithelium than humans, and possess the vomeronasal organ (Jacobson's organ). This organ facilitates the perception of smells that humans fail to detect and plays an important role in reproduction by causing the Flehmen response (Rodan, 2010). Chemical communication is essential for solitary cats that establish large territorial ranges. These cues provide an olfactory history of spatial movements, behaviour, health, and conspecific sexual status, allowing cats to obtain this information without physically contacting others. Cats that live socially engage in non-random associations with 'preferred associates' (Curtis et al., 2003). They may use 'signatures' to distinguish between familiar and non-familiar individuals in order to engage in affiliative or agonistic interactions with these conspecifics (Vitale, 2017b). These 'signatures' are biological substrates, such as pheromones in nesting material, urine, and faeces. With these, cats collect social information about their congeners through the chemical characteristics of these substrates (Vitale, 2017b).

Traditionally, it has been suggested that cats are solitary. Nonetheless, research has shown that the colonies of domestic cats in the wild are more complex social groups than simple random aggregations around food (Vitale, 2015). These relationships seem to relate to the individual characteristics of each cat's personality, as Durr and Smith demonstrate (1997). They report consistent behaviours and responses, despite changes in the cat environment, which indicates that the stability of the social environment is not crucial to maintain the stability of the individual. Personality, according to Gosling (2001), can be defined as "those characteristics of individuals that describe and explain consistent patterns of feeling, thinking, and behaving". In other words, personality is a prolonged state in which patterns of behaviour are relatively consistent in time and circumstances, but can be influenced within the animal's life. Another closely related concept is temperament. Gosling (2001) describes it as "inherited, of early appearance and with tendencies that continue throughout life, serving as a foundation for personality". It also refers to the biological dispositions of the animal. Cats consistently display temperament and personality. Numerous authors have reported consistency in three types of personality (Vitale, 2015). The first type describes a sociable, safe, simple, confident, and bold individual who initiates friendly interactions. The second type of personality describes shy, nervous, and unfriendly individuals. Lastly, the third type involves individuals with aggressive traits.

Turner et al. (1986) report that the behavioural trait of 'friendship' is consistent with kittens from three to eight months of age. The authors find correlation between the temperament or personality of the mother and father, and the behaviour of kittens towards humans. This trait could be learned from the mother; however, without denying the elements of learning, correlation was found with paternity, even in kittens that did not have contact with their fathers. From the above, the authors deduce that there is a genetic component in the personality of cats. The epigenetics of a learned behaviour ('friendship') can be demonstrated, and this behaviour – since it is transmitted – makes the cat much more successful in surviving as a domestic species. Crowell-Davis et al. (2004) described how – in a colony of stray cats – individuals had preferred associates with whom they preferred to spend more time and have affiliative interactions. This shows that cats cannot only differentiate their individual conspecifics within a colony, but also form stronger social relationships with certain individuals. Therefore, cats are able to differentiate and establish relationships with individuals both intra and interspecifically. These social skills are related to cognitive level, as social relationships

and bonds with other individuals become an important intellectual challenge. Social bonds constitute a challenge, as they require learning about others and predicting their behaviour in a given context, in order to respond appropriately in social interactions (Byrne & Bates, 2007).

3.2. Memory and Reasoning

The concept of "when an object disappears from sight, it continues to exist" proposed by Piaget (1936) is considered an important cognitive milestone for children. It can also be an important cognitive skill in animals, especially those which are expert hunters, such as cats (Vitale, 2015). If the prey disappeared behind an obstacle that obscures vision, cats would benefit from the ability to remember its location before its disappearance. Research indicates that cats can easily solve visual problems of this type (Fiset and Dore, 2006); however, their working memory did not seem to be very long compared to dogs' memory. The cats that were held for a while before being allowed to search for the object seemed not to find it. Again, at this point we must keep in mind the differences between species; cats are more easily distracted or lose interest in activities more quickly than dogs – or their interests are simply different. This can be deduced from the work of Dumas (1992), who modified the above test using a more environmentally relevant methodology with a moving prey-like object. This object aroused greater interest in the task than the containers that are typically used in invisible displacement tests where, in accordance with Piaget (1936), the object disappears inside a container in full view of the subject, who must choose the correct container. In the Dumas experiment, 19 cats were used. These were placed behind a transparent panel to observe a moving target, but the cats had to walk around an opaque panel to reach it. As they passed by the opaque panel, the object was hidden behind one of the two existing screens. As the cats did not perceive the disappearance of the object behind the target screen, the object was invisible. The results showed that cats solved this task with great flexibility, contrasting what was observed in previous research. In the discussion, the author emphasizes the difference between the two tests. In the typical Piagetian task, the information needed to succeed is retrospective, while in the new test the cats had to anticipate the current position of the object. This can be understood from the environmental relevance of this new approach: although searching can lead to mistakes (such as badly anticipating the prey's location), it is much closer to the reality of a cat, which, when it chases a prey, the prey seeks to escape by moving away and/or taking refuge. In this process the prey may change position and return to its original location.

Predators must take advantage of preys' movements by anticipating new places (Dumas, 1992). On the other hand, retrospection is more efficient when searching for food hidden in a known location. This demonstrates an important cognitive ability, as it is evaluated according to the species under study.

Whitt et al. (2009) sought to determine whether cats understood physical causality by measuring their ability to learn to work for a treat by pulling a horizontal string. They evaluated 15 cats' ability to retrieve a treat which was out of their reach, in three different configurations: (a) a single reward rope, (b) two parallel ropes where only one had a reward and (c) two overlapping ropes where only one had a reward. All the cats managed to pull the single rope to get the treat, but none consistently chose the correct rope in the other two situations. There was no evidence that the cats understood the function of the ropes or their physical causality or that their long-term memory of the cat could be evaluated. However, the authors concluded that more research should be done to fully examine the abilities of cats in this cognitive domain, especially to again ensure the appropriate methodology for the species. Cats may have found pulling the strings rewarding, regardless of the prize. It is important to investigate cognitive skills based on their importance to the environmental and ethological needs of the feline.

3.3. Learning

Cats learn from their experiences. Consequently, we can influence what a cat learns by affecting what it experiences. Desired behaviours can be rewarded, and unwanted ones ignored or redirected. We know that positive reinforcement should occur within three seconds of the desired behaviour; otherwise, the cat may engage in another activity and not associate the reward with the desired behaviour (Rodan, 2010). We also know that punishment inhibits learning and increases anxiety. A cat can learn to associate pain or fear with punishment, so punishment should never be used on cats. In addition, anxiety inhibits learning, especially learning from positive associations (Rodan, 2010).

As for vocalisation, cats use this device much more frequently when humans are present than when they are with conspecifics. This probably reflects a learning process, where the cat knows that it receives attention or food when it meows or purrs (Turner, 2017). Usually, meows are typical attention-seeking vocalisations towards humans, and are higher pitched and more pleasant than the equivalent vocalisation in feral and wild cats (Turner, 2017). Cats can vary their meowing and purring in different situations, and humans can interpret them differently, depending on their own prejudices about these

sounds. This was demonstrated by McComb et al. (2009) when studying cats' subtle use of purring to request food from their owners. The authors showed that even when playing recordings of purrs to humans not habituated to cats, they perceived a greater urgency in food-solicitation purring than in other purring. Thus, interspecific communication has potential to be an effective means of improving the level of attention or cooperation that the cat expects to receive (McComb et al., 2009).

Increasingly, cat-cognition research provides evidence of the cat's complex socio-cognitive and problem-solving skills (Vitale, 2017a). Domestic cats can be induced to perform numerous behaviours using both Pavlovian and operant conditioning. However, there is still a common belief that cats are not particularly sociable or trainable. This disconnection may be partly due to a lack of knowledge of which stimuli cats prefer and may therefore be more motivated to attain. Cats can also learn through observations. Norton (1974) (cited by Vitale, 2018) showed how kittens learned to press a lever in the presence of a light in order to receive a food reward. They learned this by observing their mothers or another adult cat – learning faster in the first case. On the other hand, kittens which did not observe either their mother or another adult cat (they were allowed to participate by trial and error) gained competence, but never with the same success rate as those which learned by observation. Lastly, the findings that Sherman et al. presented (2013) confirm that cats could be successfully trained in an adapted T-maze which combined motor and cognitive components. In that study, 18 cats were successfully trained to walk through the maze by earning positive food rewards.

4. GENERAL DISCUSSION AND CONCLUSIONS

In recent years, there has been a growing interest in feline research. This is fundamental not only to understanding the species, but also to improving the welfare of both cats and humans – especially as the popularity of cats as pets has increased globally. However, there is still much to study and understand about this species. The fascinating study of human and animal minds as intangible entities is a field that has not yet been fully explored, as we can have evidence of the feline mind only through its abilities and expressions. However, we already have enough insights that clarify this mystery and give answers to the proposed questions about whether cats have cognitive abilities – if they can feel, learn and remember. Although many of the studies cited here are inconclusive, they do have findings with practical implications for assessing and improving cat welfare and the human-cat relationship.

Only now is the scientific community beginning to study and understand domestic cats' cognition. Vitale (2018) defines feline cognition as a wide range of feline experiences that are part of behaviour. These include detection, perception, learning, remembering, and reasoning. Professor Broom (2014), recognised worldwide for his work on animal welfare and sentience, suggests that an animal is more likely to be considered sentient if it can learn, learn quickly and make fewer mistakes after learning. These cats' abilities are shown in several studies described in this review. This also allows us to assume some degree of awareness. Other inconclusive studies in this area should review their methodology to make them environmentally relevant to cats. This is a key element, since it must be understood that the mind, like many other characteristics, is species-specific. The cat's mind is unique; therefore, it must be studied from its own perspective, understanding what is relevant to the species.

There are other recent studies that, although not yet conclusive, may have practical implications for evaluating the welfare of the cat and understanding its emotions. One example is that of Dawson et al. (2019), who sought to understand feline facial expressions. Understanding expressions is a useful tool to identify affective states in other species; in cats this could help provide better care and a better understanding of their emotions, thus strengthening the human-cat bond. Further and more precise research into cat facial expressions and their meaning would also allow us to answer questions such as: "are cats more expressive in the presence of humans that are familiar or with whom they have a bond?" We should consider that it seems cats are empathetic towards familiar humans, which would reinforce the idea that they have emotions and are able to display them in context.

Cognitive research carried out in cats includes perception, object permanence, memory, physical causality, quantity and time discrimination, and sensitivity to human signals. It also includes vocal recognition and communication, attachment bonds, personality, and cognitive health (Vitale, 2015). The research thus demonstrates the ability of the cat in all these areas. However, we must not lose sight of the need to use methodologies and interpret results within the context of the species, that is, from the 'catness of the cat'. For instance, it is evident that unlike dogs, cats will not seek the help of their owner to solve tasks that involve physical problems; however, when presented with a new and ambiguous stimulus, they will use humans as a reference by looking at their behaviour.

With the growth of the domestic cat population, it is not surprising that more and more research is being done on their cognition; nevertheless, there is still much to learn about how cats perceive, learn, and make decisions about these learnings. Domestication alters a species' behaviour and challenges it to develop new and improved skills to succeed in its new conditions. There should be more research on how social or solitary life influences cognition in order to better understand the cat as a member of a multispecies family. As researchers have shown, cats can differentiate and establish relationships with individuals both intra- and inter-species.

The ability to interpret other individuals' emotions plays an important role in social individuals. As we have seen, cats have social relationships with individuals of the same species and with humans. Several studies have demonstrated cats' ability to integrate visual and auditory signals, to recognize humans and conspecifics, and to react to human and conspecific communicative signals – modulating their behaviour according to the emotional valence they experience. This demonstrates awareness and processing of information to learn and give an emotional response; this is what the mind demonstrates in any species.

According to all the evidence found, the domestic cat (*Felis silvestris catus*) is able to feel, learn, remember, act and modify its behaviour according to its experiences. It can also recognise others and recognise itself. These elements demonstrate the mind and its characteristics in this species and therefore its presence. Further research in these areas – using methodologies environmentally relevant to the species – will lead to improved conclusions that benefit its welfare. All this information would be beneficial for people considering acquiring a cat. Possibly, these data would help to reduce the difference between the owner's expectations and the cat's behaviour. Therefore, this will lead to more successful relationships, less abandonment and greater well-being. The concept of 'One Welfare', which focuses on strategies to improve human and animal welfare (García Pinillos et al. 2016) and that of multispecies families, is becoming increasingly important in the human-cat relationship for the well-being of both. Therefore, I recommend that we continue researching the cat's mind, using a greater number of subjects and methodologies designed or adapted to the natural behaviour of the cat. I also recommend that we investigate implications which the research has on the relationships between individuals (cats and humans), the improvements of domestic cats' habitats, and the resources that are provided for them to express natural behaviours.

Always, the aim should be to improve their well-being and quality of life in the short and long term.

5. RECOMMENDATIONS

The feline mind remains a mystery. Although important steps have been taken to understand it, there is a long way to go to answer questions that will help the well-being of this species and its relationship with humans. We know that cats can modify their behaviour to communicate better with us, but to what extent do they do so, and how can we respond to them? Important cognitive ability has been proven in the species, but are there cognitive differences between groups of cats (wild, feral, shelter, pet)? Further research should aim to answer questions that contribute to our scientific understanding of how cat cognition is influenced by domestication, human bonding, and adaptation from a solitary to a social lifestyle.

There is still debate about the welfare of indoor cats versus free-roaming cats and cats allowed to leave the house freely. The arguments in favour of allowing them to leave are based on the notion of naturalness, while also concerning the mental aspect. The natural behaviour of a feline is predatory and exploratory; going out, hunting, and exploring are, among others, behaviours that the indoor cat cannot perform, which can be seen as contrary to their well-being. However, the indoor cat is not exposed to serious viral and parasitic diseases or attacks from other animals – or to getting lost, which is also part of its well-being and that of its owner. We must learn much more about the free-roaming cat and its behaviour and we must develop observations that allow us to know how the cat perceives human spaces. In this way, we will be able to better manage the spaces they share with us, allowing greater well-being of the indoor cat and providing it with the environmental and nutritional enrichment that can meet its need to go out.

Also, the findings show that cats have developed social skills that allow them to understand human emotional signals, a key factor in strengthening the human-cat bond. However, it is important to conduct studies that allow us to understand the different signals they have developed to communicate with us.

Although much remains to be understood, current literature has provided a solid basis for future research. The growing interest of the scientific community in this subject, with species-specific considerations and appropriate methodologies, will likely allow us to learn much more about cat cognition in the coming years.

INVOICE NO: 01/2022

Name: Marianna
Georgiou
Barmpouti
Translator
TIN: 166108402
Direction:
Chrisostomou
Smirnis 137
13231 Petroupoli,
Athens
Telephone number:
6989516351

Invoice to:
Kevin Patrick Kostello
TIN:XXX XXX XXX
Direction:Tarragona
kevinpatrick.costello@urv.cat

DESCRIPTION	PRICE	NUMBER OF WORDS	TOTAL
SCIENTIFIC TRANSLATION/LA MENTE DEL GATO DOMÉSTICO	SPANISH>ENGLISH 0,10 EUROS/WORD	4589	458,9 EUROS*
TOTAL REVISION TIME: 6 HOURS	30 EUROS/HOUR		180 EUROS
TOTAL BASE			638,9 EUROS
VAT(+21%)			134,16€
PIT(-15%)			-95,83€
TOTAL			677,23€

Notes:

*In the text's translation there were neither repetitions nor internal matches. Therefore, no discount shall be granted.

Bank account:
3439325020003334

Due date of the invoice:
May 27, 2022

Sender :

Marianna Barmpouti

Please complete it before due date. Thank you for your attention.

TRANSLATION COMMENTARY

6.1) Translation difficulties

Using machine translation was definitely a very useful part for the translating process. With CAT tools being more and more accurate due to the advance of technology, I was able to improve the quality of the translation. However, the machine did not always choose the correct meaning of a word and was unable to place it in a specific context. As Johnson suggests, “with tens of thousands of words in every language and several different meanings to thousands of words based on the context of a word being used, it is impossible for a computer program to understand context, especially in complex situations” (Johnson, 2015). A typical example of this was the translation of the word “artículo”. In the particular abstract «sugiere que los gatos pueden interpretar bien la actitud de su propietario (positiva o negativa) hacia un artículo desconocido» the machine translation suggested the word “article”, as translation to the Word «artículo». This is a literal translation of the specific Spanish word and also one of its most common meanings. This phenomenon is called "algorithmic bias". According to this phenomenon, “machines are more likely to suggest a given term the more it is used to translate a certain word. The result is that less frequent (and therefore more creative) translations are blotted out” (Deneufbourg, 2021). In this context which refers to the owner’s attitude towards an uknown object, the choice of the word “article” would not make any sense. To solve this problem, I used the Cambridge Dictionary (2022) which provided me with the meaning “object”, which was the perfect choice for this particular context. “Competencia” was another word which was mistranslated by the machine. The machine suggested “competition”, while the author was describing a specific ability that the cats acquired. Thus, the word “competence” was more accurate and precise.

Another problem I encountered during the translating process was related to terminology. In scientific texts, terminology plays a very significant role to the understanding of the meaning. The machine translated the expression «alternancia de mirada» as “alternating eyes”. This translation would undoubtedly seem incomprehensible to the reader. In order to find the correct terminology, I searched for

parallel texts which refer to animals. I discovered an abstract of an original paper titled "Gaze alternation in dogs and toddlers is an unsolvable task: evidence of an audience effect" (Marshall-Pescini, S., 2013) and consequently use the term "gaze alternation". Using parallel texts with similar context can provide valuable solutions for the translation.

Moreover, another problem of this type of translation lies in the fact that the machine follows the sequence of words of the original text. Thus, the sentence «El 79% de los gatos mostraron una mirada referencial entre el dueño y el objeto..» was translated as "79% of the cats showed a referential look between the owner and the object..". Beginning a sentence with a number or percentage can create an image of untidiness and sloppiness of the target text. To solve this, I put the percentage in a parenthesis. "Most cats (79%) exhibited referential looking between the owner and the object.."

Furthermore, machine translation cannot follow style or copy editing guidelines. In particular, the rule of parallel structure cannot be applied in translations done by a machine. As a result, the sentences do not seem well-connected. On the other hand, "Proper parallel structure helps to establish balance and flow in a well-constructed sentence" (Paquette, 2012). In the Table 1 below, we can see the difference between the translation done by a machine and a human translation.

Table 1 - Parallel structure

Source text	Machine translation	Human Translation
..se ha incrementado el interés por la investigación en felinos, lo cual es, ***no solo fundamental para la comprensión de la especie, si no para mejorar*** *tanto el bienestar de los gatos como el de los humanos..*	..interest in cat research has increased, which is **not only fundamental for understanding** the species, **but also to improve** both the welfare of cats and humans,	This is not only **fundamental to understanding** the species, **but also to improving** both the welfare of cats and humans..

The machine translation, following the syntax and the sequence of words of the original, is unable to improve expressions which lack a certain level of fluency (Mossop's parameter). The adverb "in part" disrupts the flow of the sentence and erroneously splits the adjective "due to". As a result, the sentence is not read easily and the reader is being delayed.

Table 2 - Fluency

Source Text	Machine Translation	Human translation
Esta desconexión puede ***deberse, en parte, a la*** *falta de conocimiento de qué estímulos prefieren los gatos..*	This disconnection **may be due, in part, to** a lack of knowledge of which stimuli cats prefer..	This disconnection **may be partly due to** a lack of knowledge of which stimuli cats prefer..

6.2) Self-revision of the draft translation

a) Mossop's revision parameters

Completeness

Following copy editing rules, style editing guidelines and Mossop's revision parameters during the self-revision process of my draft translation, I have managed to make quite a few changes in order to improve the quality of my draft text. Concerning Mossop's parameters, while I was revising my draft translation, I noticed an error of completeness. In my draft translation I have omitted translating the last part of the sentence.

Table 3 - Completeness

Source Text	Draft translation	Self-revised version
Estas habilidades sociales se relacionan con el nivel cognitivo, ya que las relaciones sociales y los vínculos con otros individuos **se convierten en un desafío intelectual importante..**	These social skills are related to the cognitive level, as social relationships and bonds with other individuals..	These social skills are related to the cognitive level, as social relationships and bonds with other individuals **become an important intellectual challenge.**

Terminology

In addition, in my draft translation I used the phrase "ruffian endings" instead of the phrase "Ruffini endings" to refer to the receptors found in cats' skin, which "are named after Angelo Ruffini" (Bulbous corpuscle, 2021). After having searched on the internet, I found that the correct scientific term for the particular context was "Ruffini".

b) Copy editing guidelines

House style

Concerning the copy editing guidelines, I chose to use British and not American English throughout the text. For that reason, I corrected the spelling of the noun "vocalization" in my draft translation to "vocalisation", turned "behavior" into "behaviour", "recognize"

into “recognise” and “socialization” into “socialization” to maintain consistency and increase the level of professionalism of the translated text.

Punctuation

Additionally, in the original text the comma is not used properly. Instead of a comma, in the translation we have to use a semi colon (;) to join two sentences when the idea in the second sentence is a continuation of the idea in the first. In addition, in this way we avoid the comma splice of the original text which joined two independent clauses. In Table 4, we can see the original version compared to the draft translation and the self-revised version.

Table 4 - Punctuation (The use of the semi colon)

Source Text	Draft translation	Self-revised version
*Aquí de nuevo debemos tener presente las diferencias entre **especies,** los gatos se distraen más fácilmente o pierden interés más rápidamente en las actividades que un perro, o simplemente sus intereses son diferentes.”*	Again, at this point we must keep in mind the differences between **species,** cats are more easily distracted or lose interest more quickly in activities than dogs, or simply their interests are different.	Again, at this point we must keep in mind the differences between **species;** cats are more easily distracted or lose interest more quickly in activities than dogs, or simply their interests are different.

Another significant point where the copy editing guidelines proved very useful was in the conditional clause “if they can feel, learn and remember”. This clause contains parenthetical information and numbers specifically the cognitive abilities of the cat and thus its function is certainly explanatory. For that reason, in Table 5 it would be better to use the en dash (–) instead of a comma in order to make a parenthetical reference with added emphasis.

Table 5 - Punctuation (The use of the en dash)

Source Text	Draft translation	Self-revised version
..dar respuesta a las preguntas propuestas sobre si tienen los gatos capacidades cognitivas, si pueden sentir, aprender y recordar.	..give answers to the proposed questions about whether cats have cognitive abilities, **if they can feel, learn and remember.**	..give answers to the proposed questions about whether cats have cognitive abilities – **if they can feel, learn and remember.**

Idiomaticity

Another copy editing rule that helped me improve the quality of the translation was idiomaticity. In the following sentence “attention-seeking” as adjective sounds more

idiomatic compared to "vocalizations of seeking attention". In Table 6 below, we can observe that the self-revised version sounds more natural to native speakers.

Table 6 - Idiomaticity

Source text	Draft translation	Self-revised version
..los maullidos son vocalizaciones típicas de búsqueda de atención hacia humanos y con un tono más alto y más agradable que la vocalización equivalente en los gatos salvajes y ferales.	..meows are typical **vocalizations of seeking attention** towards humans and with a higher and more pleasant tone than the equivalent vocalization in feral and wild cats.	..meows are typical **attention-seeking vocalisations** towards humans, and are higher pitched and more pleasant than the equivalent vocalisation in feral and wild cats.

c) Style editing guidelines

Average Sentence Length

Regarding the style editing guidelines, one of my main aims was to maintain the average sentence length between 20 and 25, which is ideal in English scientific papers, in order to maximize comprehension. For this reason, below I present various examples in which it was necessary to split long sentences and create shorter ones. In table 7, we can observe that the sentence length in the source text is 40 words, while in the self-revised version the first sentence entails 25 words.

Table 7 - Reduction of the average sentence length

Source text	Draft translation	Self-revised version
Estos experimentos nos acercan a la comprensión de las habilidades sociocognitivas de los gatos para percibir las señales de los individuos de las especies con quien conviven, ***lo cual sin duda es una ventaja para el bienestar en esa convivencia.***	These experiments bring us closer to understanding the social-cognitive abilities of cats to perceive the signals of individuals of the species with which they live, **which is an advantage for the well-being of that coexistence.**	These experiments bring us closer to understanding the social-cognitive abilities of cats to perceive the signals of individuals of the species with which they live**. Undoubtedly, this is an advantage for the well-being of that coexistence.**

Table 8 - Reduction of the average sentence length

Source text	Draft translation	Self-revised version
Además, la investigación ha encontrado diferencias entre las vocalizaciones de gatos de casa y ferales, indicando que la interacción con humanos influye en la comunicación vocal (Yeon y col, 2011), ***por lo que se requieren más estudios al respecto.***	In addition, research has found differences between the vocalisations of house cats and ferals, indicating that human interaction influences vocal communication (Yeon et al, 2011) **and further studies are needed on that matter.**	In addition, research has found differences between the vocalisations of house cats and ferals, indicating that human interaction influences vocal communication (Yeon et al, 2011). **Thus, further studies are needed on that matter.**

Another example of reduction of the sentence length is the one reflected in Table 9 below. In the original text, the specific sentence was 74 words long. In scientific texts, which are compex in nature, the language should be clear, simple and communicative in order to inform and explain in the best way complicated scientific processes or experiments conducted. Consequently, splitting the long sentence of the Source Text into three short ones keeps the readers focused and helps them understand the context more easily.

Table 9 – Reduction of the average sentence length

Source Text	Draft Translation	Self-revised version
Lo anterior puede deducirse del trabajo de Dumas (1992), quien modificó la prueba con una metodología más ecológicamente relevante con un objeto similar a una presa en movimiento, ***lo cual despertó*** *mayor interés en la tarea que los contenedores típicamente utilizados en pruebas de desplazamiento invisible,* ***donde y de acuerdo a lo propuesto por Piaget*** *(1936), el objeto desaparece dentro de un contenedor a la vista del sujeto, quien debe elegir el contenedor correcto.*	This can be deduced from the work of Dumas (1992), who modified the test using a more ecologically relevant methodology with a moving prey-like object**. The object aroused** greater interest in the task than the containers typically used in invisible displacement tests and according to what was proposed by Piaget (1936), the object disappears inside a container in sight of the subject, who must choose the correct container.	This can be deduced from the work of Dumas (1992), who modified the test using a more ecologically relevant methodology with a moving prey-like object. **The object aroused** greater interest in the task than the containers typically used in invisible displacement tests. **Concerning those tests** and according to what was proposed by Piaget (1936), the object disappears inside a container in sight of the subject, who must choose the correct container.

Parallel structure

The following example in Table 10 was mentioned earlier (Table 1) in order to compare the machine to the human translation. While I was revising my draft translation, I created parallel structure using two gerunds instead of a noun and a gerund. Following style editing guidelines, I chose a verb, avoiding the extensive use of nouns and prepositions.

Table 10 - Parallel structure

Source Text	Draft Translation	Self-revised version
"Hay otros estudios recientes que, aunque tampoco son aún concluyentes, pueden tener implicaciones prácticas **para la evaluación del bienestar del gato y la comprensión de sus emociones.."**	There are other recent studies that, although not yet conclusive, may have practical implications **for the evaluation of the welfare of the cat and understanding its emotions.**	There are other recent studies that, although not yet conclusive, may have practical implications **for evaluating** the welfare of the cat **and understanding its emotions.**

Redundancy/Repetition

In the example in Table 11 below, as we can see, the word "mind" is repeated twice in this sentence. To avoid the repetition and make the sentence more concise, I removed the word "mind" and substituted it with the possessive pronoun "its".

Table 11 - Repetition of the word mind

Estos elementos demuestran **la mente y las características de la mente** en esta especie y por tanto su presencia.	These elements **demonstrate the mind and the characteristics of the mind** in this species and therefore its presence.	These elements **demonstrate the mind and its characteristics** in this species and therefore its presence.

Passive voice

In the Spanish text there were a lot of cases of passive voice which created vagueness and made the Source Text sound impersonal. Substituting the passive voice with the active, adds a more personal approach to the text, revealing the identity of the person doing the action.

Table 12 - Passive voice

*"Pero **no debe perderse de vista** la necesidad de usar metodologías e interpretar resultados dentro del contexto de la especie.."*	But the need to use methodologies and interpret results within the context of the species **should be highlighted..**	But **we must not lose sight** of the need to use methodologies and interpret results within the context of the species..

From the above, it is apparent that the copy editing rules and style editing guielines helped me improve the quality of my draft translation in various ways. First of all, the average sentence length was reduced from 27 in my draft translation to 23.7 words per sentence in my self-revised version. Secondly, the percentage of passive voice decreased by 5% – from 29% to 24%. The Flesch Reading Ease score (35.7) and the Flesch-Kincaid Grade Level (13.7) did not present considerable changes after the self-revision process. As the statistics shows, the quality of the text based on the specific parameters was enhanced. The correct use of punctuation created a more structured text, with less comma splices and more pauses. In addition, splitting long sentences into two or three short ones was a defining factor for the improvement of the

text's readability and readers' comprehension. Last but not least, removing redundancies and creating parallel structure where possible improved the fluency of the text and made the material feel more organized, without stalling the reader. Consequently, I believe that my proposed translation is of satisfactory quality.

6.3) Revision of my partner's translation

a) Mossop's parameters

My partner definitely produced a high quality translation and his revising process was largely based upon the copy editing rules, the style editing guidelines and Mossop's revision parameters. Below, I will present my suggestions for the first part of his translation.

Completeness

In Table 13, my partner omitted to translate the clause "aunque…todo su cuerpo". As we can see, an important element of the sentence has been left out and according to Mossop's parameters it is a mistake of completeness.

Table 13 - Completeness

Original text	My partner's translation	My suggestion
En cuanto a las características físicas del gato, estamos ante un mamífero cuadrúpedo, con cola, ***aunque el gato de Manx carece de ella, garras retráctiles y pelo que recubre todo su cuerpo.***	Regarding a cat's physical characteristics, we are faced with a quadrupedal mammal with a tail.	**However, other cat breeds, such as the Manx cat, do not have a tail, retractable claws and hair covering their entire body.**

Mechanics

Another suggestion I made was regarding mechanics and more specifically, punctuation. In this case, we should use the en-dash (–) instead of a semicolon. According to Chicago Manual Style (p.773), the most common use of the semicolon is between two independent clauses. "Although" does not belong to the following adverbs, "which should be preceded by a semicolon when used transitionally between independent clauses: then, however, thus, hence, indeed, accordingly, besides, and

therefore" (Staff of the University of Chicago, 773). In addition, the en-dash is more appropriate when we want to introduce an addition.

Table 14 – Mechanics (Puntuation)

*De entre las características del gato destaca su carácter**,** aunque encontraremos tremendas variaciones en función del ejemplar y de las experiencias que haya vivido a lo largo de su vida.*	Among cats' characteristics, their personality **stands out;** although we will find tremendous variations depending on the specimen and the experiences it has lived throughout its life.	Among cats' characteristics, their personality **stands out** – although we will find tremendous variations depending on the specimen and the experiences it has lived throughout its life.

Concerning mechanics and more specifically house style, I changed the American "optimization" into the British "optimisation" and "lateralization" into "lateralisation", "recognize" into "recognise" to maintain consistency throughout the text.

Mechanics (Grammar)

Concerning usage and grammar, my partner did not use the genitive case in this sentence. As I used the genitive case for a noun in plural (cats'), I should also use plural in all the other nouns that refer to cats.

Table 15 - Grammar (Genitive case)

Source Text	My partner's version	My revision
Destaca también su sentido de la vista, del oído y del olfato, lo que facilita su vida como animal depredador.	Cats sense of sight, hearing and smell also stand out, facilitating life as a predatory animal.	Cats' sense of sight, hearing and smell also stand out, facilitating **their** life as predatory **animals**.

Another example of mechanics, concerning the grammar rules is the substitution of "who" with "which" in Table 16. As the original refers to the domestic cat, we should use the relative pronoun "which" instead of "who".

Table 16 - Grammar (Relative pronoun "which")

Source Text	My partner's version	My revision
Los únicos Felidae que conviven en grupos sociales son los leones (Panthera leo), los guepardos (Acinonyx jubatus), y en ocasiones, el gato doméstico (Felis silvestris catus) ***que*** *puede mostrar niveles variables de comportamiento social no obligatorio..*	The only Felidae that coexist in social groups are lions *(Panthera leo*), cheetahs *(Acinonyx jubatus*), and occasionally, domestic cats *(Felis silvestris catus*) – **who** may show varying levels of non-compulsory social behaviour..	The only Felidae that coexist in social groups are lions *(Panthera leo*), cheetahs *(Acinonyx jubatus*), and occasionally, domestic cats *(Felis silvestris catus*) – **which** may show varying levels of non-compulsory social behaviour..

Terminology

While I was revising my partner's part, I noticed the phrase "invent better responses" as a translation to the original «inventar mejores respuestas»."Invent" here may seem similar to the word "invertar", but it is not appropriate in this context. Therefore, I suggested the verbs "create" or "build", which sound more natural.

b) Style editing guidelines

Last but not least, following the style editing guidelines, I aimed at reducing the average sentence length. This is achieved, as we can observe in the following tables, by splitting sentences that contained a lot of words.

Table 17 - Reduction of average sentence length

Source Text	My partner's version	My revision
Se han realizado estudios en humanos mostrando que las personas pueden responder emocionalmente a un rostro de forma muy diferente ***dependiendo de*** *si esa cara muestra una expresión feliz, triste o enojada, incluso cuando no tienen conciencia consciente de haber visto un rostro (Dimberg y col, 2002).*	Studies on humans have shown that people can respond emotionally to a face very differently **depending on** whether that face shows a happy, sad, or angry expression – even when they are not consciously aware of having seen a face (Dimberg et al., 2002).	Studies on humans have shown that people can respond emotionally to a face very differently**. Their response depends on** whether that face shows a happy, sad, or angry expression – even when they are not consciously aware of having seen a face (Dimberg et al., 2002).

Table 18 - Reduction of average sentence length

Source Text	My partner's version	My revision
Quizá para obtener conclusiones exactas al respecto falte mucho, pero el análisis de los resultados de investigaciones sobre cognición, toma de decisiones, razonamiento, la psiquis, entre otros, comienzan a dar pistas sobre el fenómeno de la mente animal.	Perhaps there is still a long way to go to obtain exact conclusions**, but the** analysis of research results on cognition, decision making, reasoning, and the psyche (among others) are beginning to provide clues about the phenomenon of the animal mind.	Perhaps there is still a long way to go to obtain exact conclusions. **However, the** analysis of research results on cognition, decision making, reasoning, and the psyche (among others) are beginning to provide clues about the phenomenon of the animal mind.

6.4) My partner's suggestions

a)Mossop's parameters

Terminology

My partner Nicholas contributed actively to the enhancement of my proposed translation, managing to use the correct terminology. In the example below the third version sounds more natural compared to the second one. "Evidence" and "evidencia" may seem very similar, but in this context "evidencia" means "obviousness", "intensity" and does not have the meaning of "proof".

Table 19 - Terminology

Source Text	Proposed translation	My partner's revision
«Los gatos reaccionaros con mayor evidencia..»	"Cats reacted with increased evidence.."	**"Cats reacted more intensely.."**

My partner also improved my proposed translation opting for "environmentally relevant methodology" instead of "ecologically relevant methodology". As ecologically is used for larger-scale contexts relating to natural habitats, the word environmental is used for smaller-scale contexts like a cat's surroundings.

b) Style editing Guidelines

Parallel structure

In addition, my partner using style editing guidelines and more specifically parallel structure managed to improve the level of comprehension of the text. According to Amy Luo, "sentences with parallel structure are easier to read and add a sense of balance to your writing" (Luo, 2019). As a result, the third version is read more easily and creates a sense of rhythm (See Table 20 below).

Table 20 - Parallel structure

Source Text	Proposed translation	My partner's revision
.. *"explican patrones consistentes de* ***sentimiento, pensamiento y comportamiento****"..*	"..explain consistent patterns of **feeling, thinking, and behaviour**.."	"..explain consistent patterns of **feeling, thinking, and behaving**"

Another example of parallel structure he included in his corrections of my translation is the one reflected in the table below. With his correction, he managed to create a sense of connection between the two sentences with the structure when+subject+verb and facilitated the reading process.

Table 21 - Parallel structure

Source Text	Proposed translation	My partner's revision
En cuanto a la vocalización, los gatos la emplean mucho más frecuente ***cuando los humanos están presentes*** *que cuando están con coespecificos, lo que probablemente refleja un proceso de aprendizaje, donde el gato sabe que recibe atención o alimento* ***al maullar o ronronear*** *(Turner, 2017).*	As for vocalisation, cats use it much more frequently **when humans are present** than **when they are with conspecifics.** This probably reflects a learning process, where the cat knows that it receives attention or food **when meowing or purring.**	As for vocalisation, cats use it much more frequently **when humans are present** than **when they are with conspecifics.** This probably reflects a learning process, where the cat knows that it receives attention or food **when it meows or purrs.**

Nominalisation

Another style editing guideline that he followed was the avoidance of nominalisation. The English language prefers verbs instead of nouns in contrast with the Spanish language. Therefore, to make the text sound more natural and concise, he used the structure when+verb.

Table 22 - Use of verbs instead of nouns

Source Text	Proposed translation	My partner's revision
sin embargo, ***frente a la presentación*** *de un estímulo nuevo y ambiguo si utilizarán como referencia al humano mirando su comportamiento.*	however, **in the face of the presentation** of a new and ambiguous stimulus, they will use humans as a reference by looking at their behaviour.	however**, when presented with** a new and ambiguous stimulus, they will use humans as a reference by looking at their behaviour.

c) Copy editing comments

House style (Numerals)

Last but not least, he followed the copy editing rules that were concerning the mode of orthography that is followed in books or journals. For the texts prepared for publication, numbers from one to nine should be written with full words.

Table 23 - Numerals

Source Text	Proposed translation	My partner's revision
Sabemos que el refuerzo positivo debe ocurrir dentro de **3** segundos del comportamiento deseado;	We know that positive reinforcement should occur within **3** seconds of the desired behaviour;	We know that positive reinforcement should occur within **three** seconds of the desired behaviour;

From the above, it can be concluded that my partner enhanced significantly the quality of my proposed translation, taking into account a variety of copy editing rules and style editing guidelines.

Budget and Invoice Comparison

The creation of a budget plays a very important role in the relationship between clients and translators. This is attributed to the fact that through the budget, the clients can decide whether or not they will accept the offer, as it helps them consider if they can afford the estimated cost. In addition, a well-planned and thoroughly designed budget can promote an image of professionalism and attention to detail

For that reason, the budget I created for the purposes of the TFM includes all the necessary information a client has to know about the translation of the text «La mente del gato doméstico». As my general prices of scientific translation range from 0,10 to 0,12 euros per word, depending on the difficulty of the text, the final price ranges from 750-1200 euros, too (including the discounts for repetitions or internal matches). The budget also includes payment instructions and terms, as the amount of money to be paid should be transferred through my bank account 30 days after the invoice date.

The invoice should be carefully planned, as it is an official document and entails detailed information about the price of the overall work. Thus, compared to the budget, the invoice includes the taxes in the final price, while the budget entails the base price excluding VAT and PIT taxes.

As we can observe, in terms of the economic aspect, there are differences between the budget's estimated cost (750-1200 euros) and the final price of the invoice, too (677, 23 euros). As the budget was created when I first saw the advertisement and before speaking to the client, it is a logical conclusion that the price would differ. The original text entails 9.441 words and my client asked me to translate half of the text and revise my partner's translated half, while asked my partner Nicholas to do the same. Consequently, the total number of words that I had to translate was 4.589.

In relation to the work carried out, I think that the budget was generally well-timed even though the requirements of the client changed. In total, I needed twelve days for the whole translating and revising process. Therefore, the fourteen days that I calculated for the budget were more than enough. In my opinion, planning a budget is most of the time worthwhile, as in this case it helped me organise the time I needed to carry out the work. Although the budget entails limited information about the price of the translation compared to the invoice, it definitely helps the customer to have a general idea about the prices and the type of work the translator does. However, when the client's requirements change, as happened in this case, it is possible that the

translator needs more or less time to do the job. Negotiation and good communication skills are the keys to cooperating well and building a relationship of trust with the client.

Finally, when I sent my client both the budget and the invoice there were no conflicts and our cooperation was really good. My client's guidance was valuable, as he specifically determined the steps that I had to follow for the elaboration of this project. My client was very kind, thanking me for the hard work on this project.

Conclusions

The use of a machine for translating purposes can really help speed up the translating process. However, we should always take into account the potential mistakes that could occur and the low level of accuracy the machine offers most of the times. For that reason, I used online dictionaries and parallel texts that helped me increase the level of idiomaticity and precision. Although these tools were indispensable for the aspect of accuracy, the knowledge of copy editing rules and style editing guidelines were vital for the aspect of comprehension of the translated text.

Furthermore, I drew the conclusion that sometimes the budget which is created in the beginning of a project can be subjected to a lot of alterations, due to changes in the requirements of the customer. However, creating a budget may prove very useful. In case of a demanding or an unreliable customer it is better to send them the budget before the cooperation starts, in order to confront any upcoming problems prior to the translating process.

The translating and revising process of the text «La mente del gato doméstico» for the purposes of my master's dissertation was quite an enriching experience. Throughout both of these processes, my knowledge of the copy editing rules and style editing guidelines was consolidated. Through the revising process, I realised how significant it is to view your translated text with fresh eyes in order to be able make the necessary corrections. The revision I did on my partner's abstract made me consider what kind of mistakes a translator can make without realising it and raised my awareness about the mistakes I would like to avoid. Moreover, the comparison of the original with the proposed versions and the final translation helped me observe step by

step the changes that were made and the way with which the quality of the translation was enhanced in each version.

CITATION

artículo. 2022. In *Dictionary.Cambridge.org*. Retrieved 21 April 2022, from https://dictionary.cambridge.org/dictionary/spanish-english/articulo?q=art%C3%ADculo

Bulbous corpuscle. (2021, February 23). In Wikipedia. https://en.wikipedia.org/wiki/Bulbous_corpuscle

Deneufbourg G. (2021, Dec. 22). *The problem with machine translation: beware the wisdom of the crowd*. Theconversation. https://theconversation.com/the-problem-with-machine-translation-beware-the-wisdom-of-the-crowd-171913

Glosbe.com. 2011. Retrieved April 22, 2022, from https://glosbe.com/es/en

Johnson T. (2015, Dec. 21). *The Problems with Machine Translation* . Inwhatlanguage. https://www.inwhatlanguage.com/the-problems-with-machine-translation/

Luo A. (2019, May 2) *Parallel Structure in Writing | Definition and Examples*. Scribbr.https://www.scribbr.com/language-rules/parallelism/#:~:text=Maintaining%20parallel%20structure%20helps%20you%20avoid%20grammatically%20incorrect,add%20a%20sense%20of%20balance%20to%20your%20writing

Marshall-Pescini, S. (2013) *Gaze alternation in dogs and toddlers in an unsolvable task: evidence of an audience effect. Animal Cognition*, volume 1 (16), 933–943. https://link.springer.com/article/10.1007/s10071-013-0627-x

Paquette J. (2012, Apr. 2). *Parallelism, Parallel Structure, Parallel Construction*. Writing Commons. https://writingcommons.org/section/grammar/parallelism-parallel-structure/

Spanishdict.com. 2014. Retrieved April 25, 2022 from https://www.spanishdict.com/

Staff of the University of Chicago Press. (2006). *The Chicago Manual of Style* (15th ed.), p. 773. https://campusvirtual.urv.cat/pluginfile.php/4183237/mod_resource/content/1/The%20Chicago%20Manual%20of%20Style%20%282003%29.pdf

ANNEX

Self-evaluation report

My post-graduate experience in the university Rovira i Virgili has been extremely pleasant. Through the different online courses offered by the university, I was constantly challenged to consider ways to enhance the quality of each translation. The variety of courses provided has aided to develop a professional identity as a translator. Starting the academic year with the course «Herramientas para la Traducción Especializada» I had the opportunity to work with useful CAT tools, such as "Matecat" and "Memsource" and develop technological competence. Courses that focused on terminology, such as Financial and Legal Translation, were also very useful. Through these courses, the students learnt how to search on the internet for the correct term and how to reject or accept certain terms in order to attain a high level of accuracy. Courses that focused on revision, such as «Revisión, Edición y Postedición de Textos Traducidos» and "Revising, Editing and Post-editing translated texts" taught me the importance of paying attention to detail, following Mossop's parameters, Copy editing rules and Style editing guidelines. They also taught me how to look at a translation with fresh eyes during the revision of a text.

Although I did not have any experience with translation before the beginning of the Master's in Professional Spanish-English translation, after the end of the TFM I feel that I am equipped with valuable knowledge and skills that will help me in my future career. As my master's dissertation required both translating and revising processes, I feel that my TFM was the most appropriate way to use and consolidate all the knowledge I acquired in the master's. If I compare the invoices and budgets that I created in the first semester of the programme with the ones created for my TFM, I definitely observe improvements in the design and the layout of the elements included. I also notice that I took into consideration the language combination and the complexity of the text in order to offer a competitive price. The sessions of the course «La gestión del negocio», were really useful for my future career as a translator, as they helped me develop a high level of professionalism and promote a positive image.

Additionally, for the purposes of the TFM, I had the opportunity to delve deeply into the aforementioned copy and style editing guidelines, and acquire useful

knowledge about texts that will be published. As Spanish and English are not my native languages, through my final project I had the chance to practice both languages. Moreover, for the needs of my TFM I had to collaborate and communicate with my partner Nicholas in order to revise his first part of the translation. In the beginning we had to decide which part we would translate, dividing the text in half. At the end of the procedure, we had to decide who would be the project manager. Thus, communicating with students from other countries and exchanging opinions and thoughts certainly helped me develop multicultural consciousness. Even though I live in Greece and Nicholas lives in New Zealand, we managed to communicate very well despite the different time zones.

Last but not least, I would like to mention my tutor's invaluable help and guidance. My tutor, Kevin Patrick Kostello, had advised us thoroughly about the steps that we should take in order to structure this TFM. Moreover, the material that he had uploaded on moodle was really helpful and definitely contributed significantly to the generation of ideas for this paper.