

Effectiveness of physiotherapy interventions for injury in ballet dancers: A systematic review

Marlena Skwiot, Zbigniew Śliwiński,
Arkadiusz Żurawski, & Grzegorz Śliwiński



Abstract: The unique repetitive nature of ballet dancing, which often involves transgressing endurance limits of anatomical structures, makes dancers prone to injury. The following systematic review aims to assess the effectiveness of physiotherapy interventions in the treatment of injuries in ballet dancers. The review was performed in line with the PRISMA statement on preferred reporting items for systematic reviews and meta-analyses. Six electronic databases (PubMed, Ovid Embase, Cochrane, Medline, PEDro, Google Scholar) were queried. The study populations comprised active ballet dancers and/or ballet school attendees with acute and chronic injuries and those with persistent pain. There were no restrictions regarding age, sex, ethnicity or nationality.

The Modified McMaster Critical Review Form for quantitative studies was used to assess the methodological quality of the studies reviewed in accordance with the relevant guidelines. Out of the total of 687 articles subjected to the review, 10 met the inclusion criteria. Diverse physiotherapeutic interventions were described and effectiveness was assessed using different parameters and measurements. Overall, the results indicate that physiotherapy interventions in ballet dancers exert a positive effect on a number of indices, including pain, ROM and functional status. Due to the small amount of evidence confirming the effectiveness of physiotherapeutic interventions in ballet dancers after injuries and methodological uncertainties, it is recommended to improve the quality of prospective studies.

Discussion

The present systematic review aimed to investigate scientific evidence regarding physiotherapy interventions in ballet dancers. It is the first systematic review to present physiotherapeutic management in dancers. The evidence base was rather modest, with 10 studies representing different research projects. The summary of the results indicates that physiotherapy interventions may exert a positive influence in several domains, such as pain, ROM, functional status, posture, gait or quality of life. Consistent evidence in favor of effectiveness of physiotherapy was particularly demonstrated with regard to pain reduction, which indicates that physiotherapy interventions may be instrumental in the return of dancers to practice and performances. Despite these positive findings, the results need to be interpreted with caution in view of methodological limitations and non-homogeneity of the evidence base.

Physiotherapy interventions in ballet dancers were associated with positive effects in several areas as demonstrated by both positive and negative measurements. This revealed a potential for using physiotherapy in this group of patients.

There is evidence confirming analgesic effectiveness of similar interventions in physically active populations, for example with ESWT. Hides et al. confirmed the effectiveness of stability training for the lumbosacral spine in athletes. However, other authors of systematic

reviews have objected to formulating strong conclusions about this type of training as an isolated intervention for improving sports results, including pain reduction and reducing recovery time following an injury. It has also been reported that dry needling produced the desired effects in the treatment of knee pain both as a sole intervention in athletes with patellofemoral knee syndrome and in conjunction with manual therapy and exercise in patients with osteoarthritis.

The effectiveness of physiotherapy in dancers was assessed with various functional tests and, often, ROM measurements. The following tests are often used for assessing the functional status of the lower limbs and lumbosacral spine owing to ease of administration, simplicity and reproducibility: SLR, Patrick test, Thomas test, single leg squat test and others. In view of the aesthetic and technical demands of dance, associated with extreme ROM, Filipa et al. used the Beighton scale to identify joint hypermobility syndrome (JHS). Other studies have considered JHS a risk factor for experiencing pain in children and adults. However, the evidence that this tendency is also present in dancers is not equivocal. There are functional assessment scales designed with dancers in mind, such as the Dance Functional Outcome Survey (DFOS), which was used in one study. Other authors have also used this tool to assess the effectiveness of comprehensive rehabilitation of a modern female dancer with metatarsal instability, achieving an improvement from 11% to 90%.

Filipa et al. reported improved mood on completion of the physiotherapy intervention, using the standardized PedsQL questionnaire as a tool. This was probably due to the positive influence of pain reduction and resumption of dance practice. Earlier studies had reported higher levels of burnout in dancers and athletes, who suffered physical and emotional exhaustion, compared to injury-free individuals. Reduced quality of life was also reported in injured athletes. This confirms a significant negative effect of pain on depressive mood and increased risk of burnout in physically active individuals. Depressed mood in dancers may be associated with excessive physical training, which, combined with other external factors, may lead to injuries and overload syndromes, which may produce a general deterioration of health and well-being in the dancers. Furthermore, the break from practice in injured athletes may reduce their quality of life. Adequate injury perception by physically active individuals would facilitate evidence-based treatment and physiotherapy strategies targeting the physical and psychosocial aspects of health. Consequently, this systematic review can prove very useful in planning effective physiotherapy interventions in dancers.

Limitations

Even though the present paper is based on the best practices for systematic reviews (PRISMA), it is not free of limitations. The review was based on electronic databases, implementing secondary search strategies. As a result, certain studies may have remained unidentified and excluded from the review. The exclusion of non-English publications was another limitation. Ultimately, a total of 10 publications meeting the inclusion criteria were qualified, which is a modest evidence base, although the findings were actually consistently positive. At the same time, there were certain concerns and limitations as regards the methodological quality of the studies reviewed. 80% of the studies were case reports or case series, and, therefore, the provision of a rationale for the sample size and statistical analysis might turn out to be unnecessary or impossible. Accordingly, there are no grounds for extrapolating these results to the entire population of ballet dancers. Furthermore, in some of the studies, physiotherapy procedures were supplemented by other interventions, such as surgery.

Conclusions and practical implications

The positive effects of physiotherapeutic interventions have highlighted the potential role of physiotherapy for ballet dancers after injuries, which are an important health problem in this specific group of patients. Due to the small amount of evidence confirming the effectiveness of physiotherapeutic interventions in ballet dancers after injuries and methodological uncertainties, it is recommended to improve the quality of prospective studies. The use of more standard results with long observation periods would help to identify potential therapeutic effects in ballet dancers.

There is evidence to support the use of physiotherapy interventions in injured ballet dancers. Physiotherapy exerted a positive influence in several domains, including pain, ROM and functional status. However, while physiotherapy may be considered as an option for managing injuries in ballet dancers, caution should be exercised while these recommendations are implemented on account of methodological concerns regarding the existing evidence base.

Fonte: Disponível em: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8224967/> Acesso em: março de 2024. (texto adaptado)

QUESTÕES

QUESTÃO 01. Observe o excerto abaixo e responda:

*Physiotherapy interventions in ballet dancers were associated with positive effects in several areas as demonstrated by both positive and negative measurements. **This** revealed a potential for using physiotherapy in this group of patients.*

O pronome demonstrativo **this** se refere:

- a) às intervenções fisioterapêuticas em dançarinos(as) de balé.
- b) à associação dos efeitos positivos às intervenções fisioterapêuticas.
- c) às métricas positivas e negativas demonstradas no estudo.

QUESTÃO 02. Leia as duas assertivas retiradas do texto “*Effectiveness of physiotherapy interventions for injury in ballet dancers: A systematic review*”.

Assertiva 1: *Earlier studies had reported higher levels of burnout in dancers and athletes, who suffered physical and emotional exhaustion, compared to injury-free individuals. Reduced quality of life was also reported in injured athletes.*

Assertiva 2: *Depressed mood in dancers may be associated with excessive physical training, which, combined with other external factors, may lead to injuries and overload syndromes, which may produce a general deterioration of health and well-being in the dancers.*

Considerando as assertivas acima, qual das seguintes afirmações é uma **conclusão válida**?

- a) Há um significativo risco de dor muscular em indivíduos que apresentam quadros depressivos e episódios de esgotamento mental, não necessariamente ligados ao universo da dança.
- b) A importância deste estudo reside na percepção adequada apenas de machucados e contusões físicas. A sistematização dos aspectos psicológicos dos indivíduos possui importância secundária e não são considerados ao longo de tratamentos fisioterapêuticos.
- c) Tratamentos fisioterapêuticos são importantes para o cuidado de machucados e contusões físicas em bailarinos. Fatores psicossociais, como a pressão para um excelente desempenho, podem ser considerados ao longo de tratamentos físicos por serem associados à dança.

QUESTÃO 03. *Uma oração subordinada substantiva é uma sequência de palavras que atua como um único componente dentro de uma frase e pode funcionar como sujeito, objeto direto ou indireto, ou ainda, complemento de uma preposição.*

Fonte: Traduzido e adaptado de Macmillan Academic Skills (2021).

*Due to the small amount of evidence confirming **the effectiveness of physiotherapeutic interventions in ballet dancers after injuries and methodological uncertainties**, it is recommended to improve the quality of prospective studies.*

O excerto acima apresenta uma **oração subordinada substantiva** essencial para seu entendimento. A passagem em negrito funciona como:

- a) Objeto direto, trazendo a informação de que a eficácia das intervenções fisioterapêuticas é incerta e por isso recomenda-se melhorar a qualidade dos estudos prospectivos.
- b) Objeto indireto, por trazer a informação extra de que a eficácia das intervenções fisioterapêuticas é incerta e por isso recomenda-se melhorar a qualidade dos estudos prospectivos.
- c) Objeto indireto, por indicar o sujeito da frase, realçando que a eficácia das intervenções fisioterapêuticas é incerta e por isso recomenda-se melhorar a qualidade dos estudos prospectivos.

TEXTO PARA AS QUESTÕES 04 E 05

A tabela abaixo faz parte do artigo “*Effectiveness of physiotherapy interventions for injury in ballet dancers: A systematic Review*”. Analise o seu conteúdo e responda às **questões 04 e 05**.

NHMRS FORM Framework		
Component	Grade	Comments
1. Evidence base	D-Poor <i>Level IV studies, or level I to III studies with high risk of bias</i>	<i>Quantity: 10 studies Participants: 83 ballet dancers with musculoskeletal pain Level-II: 0 studies Level-III-2: 1 study Level-III-3: 1 study Level-IV: 8 studies</i>
2. Consistency	C-Satisfactory <i>Some inconsistency reflecting genuine uncertainty around clinical question</i>	<i>Findings consistent Multiple study designs Heterogeneous interventions Varied population–injury type, age Varied outcome measures and time point measurements</i>
3. Clinical impact	D-Poor Slight	<i>Consistent findings for outcomes: in particular pain Only one study has statistical significance The clinical significance should be approached with caution No adverse effects reported</i>
4. Generalisability	B-Good <i>Population/s studied in the body of evidence are similar to the target population for the guideline</i>	<i>Population of studies is similar to the target Age range: 11–29 years Despite various types of injuries and interventions, symptoms in the entire population were associated with ballet dance training Studies conducted in five different countries that have different health care contexts</i>
5. Grade of recommendations	D-Poor <i>The evidence is weak, so the recommendations should be used with caution</i>	<i>These studies had low evidence and were of moderate methodological quality. Although overall there were positive results, the current evidence base is not homogeneous in terms of diagnosis, interventions delivered, and parameters and results measured for ballet dancers.</i>

Fonte: Tabela retirada integralmente do artigo *Effectiveness of physiotherapy interventions for injury in ballet dancers: A systematic review*. Disponível em: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8224967/>. Acesso em março de 2024.

QUESTÕES

QUESTÃO 04. Considere as seis afirmações abaixo:

- I. A tabela apresenta um sumário dos resultados; os resultados positivos são unânimes em relação às evidências-base; os resultados podem ser de grande ajuda na fisioterapia dos dançarinos, mas as recomendações devem ser implementadas com cautela.
- II. A tabela apresenta um resumo dos resultados; os resultados, embora positivos, são sistematizados com ressalvas metodológicas em relação às evidências-base; as recomendações conclusivas devem ser implementadas com cautela.
- III. O estudo contou com 83 participantes e todos os quatro níveis apresentados na primeira linha da tabela são livres de qualquer viés parcial.
- IV. O estudo contou com 83 participantes próximos às características do público alvo para aplicação dos resultados do estudo.
- V. Embora o grupo apresentasse contusões distintas, estas eram associadas direta e indiretamente à atividade do balé. Aspectos geográficos dos cinco países analisados foram levados em consideração na sistematização das contusões dos indivíduos.
- VI. Embora o grupo apresentasse contusões distintas, estas eram associadas direta e indiretamente à atividade do balé. Aspectos pertinentes aos sistemas de saúde dos cinco países analisados foram levados em consideração na sistematização das contusões dos indivíduos.

Podemos afirmar que:

- a) I, II e V são verdadeiras.
- b) II, III e IV são falsas.
- c) II, IV e VI são verdadeiras.

QUESTÃO 05. A tabela apresenta um sistema de atribuição de notas com cinco componentes, em que **D-Poor** figura como a menor nota atribuída, e **B-Good** a maior. A respeito do vocabulário utilizado na atribuição de notas, podemos afirmar que:

- a) *caution*, *bias* e *weak* são substantivos com conotação negativa, isto é, a interpretação das notas atribuídas vinculadas a estes substantivos é subjetiva e arbitrária.
- b) o adjetivo *slight*, embora possa ser traduzido como leve ou sutil, ao ser vinculado à nota *D-Poor* passa a ter conotação negativa, por descrever o baixo impacto clínico do estudo.
- c) *consistency*, *uncertainty* e *satisfactory* pertencem ao mesmo grupo semântico, o que justifica o uso das palavras para a descrição da nota atribuída ao segundo componente da tabela.

A linguistic-pragmatic analysis of cat-induced deixis in cat-human interactions

Leonie Cornips; Marjo van Koppen; Sterre Leufkens; Kristin Melum Eide; Ronja van Zijverden



Abstract: The present paper contributes to the emerging field of embodied interaction. It reports on research into deictic interactions between a human and a non-human, specifically a cat, interlocutor, applying a pragmatic framework developed for human-human communicative interactions. We analyze video recordings of interactions where a cat is a deictic agent pointing the human interlocutor either to the door or the food bowl. We show that these interactions show triadic pointing, hence, focusing joint attention on a common object as a proxy for the event i.e., providing food in the bowl and opening the door.

We show that the cat also checks whether the human understands her intentions and that she confirms the human's interpretation. We do not restrict ourselves to vocal communication - as is often done in human language studies -, but we examine how in cat-human communication the cat and human bodies are used to express deixis. Thus, we conceptualize deixis as an embodied interpersonal i.e., interspecies phenomenon. We show that the cat interlocutor uses her body, e.g. eyes/body/tail/ears, as well as her voice, meowing/ purring, within this complex deictic interaction.

Keywords: Human/cat interaction; Deictic interaction; Embodied interaction; Pragmatics of interspecies interaction; Animal referential pointing; Cat as deictic agent.

Pragmatics of human-animal communication

This paper addresses the interaction between so-called domestic cats and their humans in the shared home setting. More specifically, we investigate the deictic cues induced by cats in interspecies interactions and argue that these cues objectively lend themselves to a linguistic-pragmatic analysis of deixis originally developed for human-human interaction (Stukenbrock, 2020). (...)

This paper investigates the expression of deictic reference by cats asking for the attention of the human via sound, eye-gaze, and gestures, as well as the expression of spatial reference pointing to a certain object in a shared space (Bühler, 1990:111; Diessel, 2006). Our linguistic study is unique, firstly because it incorporates insights from human linguistics, veterinary studies, behavioral psychology, and biology, and secondly, and most importantly, because it observes what the cat indicates as relevant in the unfolding sequential interaction with human(s). In an investigation into the full range of communication strategies, we stay open to all possible communicative elements, requiring close analysis of the entire body of all interaction partners.

The aim of this paper

The aim of the present paper is to examine a selected set of interspecies communication acts between cats and humans where the feline interlocutor is the agent inducing the potential

deictic cues. In our study, we investigate whether the sequential steps observable in cat-human interaction mirror those attested in human-human communication, and whether Stukenbrock's (2020) model offers a suitable format to observe and describe the precise deictic resources characterizing (successful) cat-human interactions. One of the questions we aim to answer is whether the deictic interaction can be construed as imperative (I want that), declarative (I want to share information with you) or something in between. We will investigate the embodied deictic cues the cat uses in her interaction with human interlocutors and describe and analyze the sequential organization of these interactions.

Methodology: data collection

Twenty-one videos totaling 18min and 41s were collected. Four of these were selected and qualitatively analyzed through interpretive video analysis, focusing on “*the meanings of actions to the actors involved*” in social interactions (Knoblauch et al., 2014:436). The format of this article only allows us to present the transcriptions and detailed analysis of two of them: interactions between the cat Salma and the human members of her household (KME, the fourth author; and H, her husband, respectively). These two videos were carefully chosen firstly because of their representativity since they incorporate the relevant features of the interactions for all twenty-one videos thus far collected. Secondly, these two interactions were recorded before this research project existed (August 30, 2020/March 16, 2021). We hence know that the recordings were not made for scientific purposes and the interaction recorded is therefore not modified through *reactivity* (Knoblauch et al., 2014), where the activity of the human making the video-recordings is affected because of the scientific goals, e.g., making the video-recording the priority and/or pretending not to understand the cat's intentions. Thirdly, the technical quality of these videos allows for clear visibility of the interaction unfolding. Fourthly, these recordings show Salma taking the initiative to establish the deictic space successfully in a very short time span; allowing us to include both the transcription and the analysis of two interactions within the word limits of this paper.

Methodology: data analysis, methods and procedures

The four videos were analyzed using VideoNote. The analysis consisted of several steps. Firstly, the temporal sequence of events was transcribed, including the gestures and activities performed (Knoblauch et al., 2014). A combination of Systematic Text Condensation (STC) (Malterud, 2012) and the naturalistic inquiry method (Beuving and de Vries, 2014) was used to code and summarize the data. The transcripts were unitized, where the units contain information relevant to the research topic (Beuving and de Vries, 2014; Brinkmann and Kvale, 2015; Malterud, 2012). Specifically, actions corresponding to the different steps involved in establishing deixis, as indicated by Stukenbrock (2020), were identified in the transcripts. The interpretation of the data has been done as objectively as possible, only referring to aspects of the interaction that could be seen in the videos. Video frame grabs were also used to illustrate visible conduct such as eye gazing (Hepburn and Bolden, 2013).

Analysis of excerpt 1: deictic spatial reference towards food bowl in utility room

According to Stukenbrock (2020), a deictic interaction starts when a focused interaction is established. The sender must first make sure the addressee is attentive to the interaction. In the video, Cat Salma gazes, meows, and walks towards Human K. K responds by moving towards Salma, thus showing that she is indeed attentive and cooperative.

When this focused interaction is established, the next step is to identify the deictic space. The final domain of pointing is the utility room containing the food bowl. Since Salma and K are not in that room when the interaction starts, Salma seems to lure K towards this space. Salma gazes towards K and then turns away from her and walks towards the door post of the utility room containing the food bowl. When the deictic space is reached, the Sender points to the referent. In our case study, Salma's referent is the food bowl, or rather the food that should go into the food bowl.

Discussion and conclusion

The deictic interactions discussed in this paper result in achieving the cat's goal (getting food in the bowl in an adjoining room, getting the door to be opened by pushing down the door handle). We have applied the pragmatic framework developed by Stukenbrock (2020) for human–human interaction to cat-human interactions. The analysis shows that the cat's expressions follow the same sequential ordering as those which characterize human–human interaction: the deictic interaction starts when a focused interaction is established, followed by an identification of the deictic space and (bodily) pointing to the relevant object, the careful monitoring of whether the Addressee is still participating in the interaction, and finally the communicative success with the Addressee.

In the present analysis, the body emerges as the crucial locus of deixis, which in turn entails that one (and perhaps the only) prerequisite to deixis is that there is a body. As is expected, the specific expression of deixis must depend on the kind of body possessed by the Sender: there are aspects of “human deixis” that cats cannot express (pointing with a finger), and vice versa (turning of ears).

Fonte: Disponível em: <https://doi.org/10.1016/j.pragma.2023.09.002> Acesso em marco de 2024. (texto adaptado)

QUESTÕES

QUESTÃO 06. Na leitura do *abstract* do texto, é possível inferir uma sequência de informações sobre a pesquisa desenvolvida que faz parte do gênero textual **resumo de artigo científico**. Assinale a alternativa que dispõe tais informações na sequência correta.

- a) (1) apresentação da área de conhecimento em que o estudo se enquadra; (2) definição da pesquisa, com a informação sobre a abordagem aplicada no referido estudo; (3) apresentação do instrumento de coleta de dados, mostrando seu uso para além da comunicação oral; (4) breve relato de resultados referentes a apenas um dos participantes da pesquisa.
- b) (1) apresentação do objetivo geral da pesquisa e sua contribuição para a grande área de conhecimento; (2) apresentação dos objetivos específicos do estudo; (3) breve relato do percurso metodológico e dos instrumentos de coleta de dados; (4) apresentação das limitações do estudo por conta de o uso do instrumento de coleta de dados não ser específico para um dos interlocutores/participantes.
- c) (1) apresentação da contribuição do estudo para a área de conhecimento emergente; (2) apresentação do relatório de pesquisa e como se deu sua condução; (3) apresentação das questões de pesquisa; (4) informações acerca dos instrumentos de coleta de dados, bem como as limitações do estudo pela escolha da metodologia de análise dos dados.

QUESTÃO EXTRA

“Palavras-chave são termos ou frases que resumem o conteúdo principal de um texto, documento, página da web, ou qualquer outro tipo de informação. Elas são frequentemente utilizadas em mecanismos de busca, bancos de dados, catálogos online e outros sistemas de organização e recuperação de informações para ajudar os usuários a encontrar rapidamente o que estão procurando.”

Texto redigido pela equipe de elaboração de exames do Instituto de Línguas (Março, 2024).

A respeito das palavras-chave do abstract de *A linguistic-pragmatic analysis of cat-induced deixis in cat-human interactions*, a opção que apresenta a melhor seleção dos termos em língua portuguesa é:

- a) Interação entre humanos e gatos; dêixis interativas; interação entre espécies pragmáticas.
- b) Interação entre humanos e gatos; interação dêítica; pragmáticas da interação entre espécies; gatos como agentes dêíticos.
- c) Interação entre humanos e gatos; interação antropomórfica; pragmáticas da interação entre espécies.

QUESTÃO 07. *“Procedimento metodológico, em pesquisa acadêmica, refere-se aos métodos e técnicas utilizados para realizar uma investigação científica. Isso inclui todas as etapas desde a formulação da pergunta de pesquisa até a coleta, análise e interpretação dos dados, bem como a elaboração de conclusões. Os procedimentos metodológicos variam dependendo do tipo de pesquisa e dos objetivos específicos do estudo. Eles geralmente são descritos em detalhes no protocolo de pesquisa ou no método da publicação científica para garantir a transparência do estudo.”*

Texto redigido pela equipe de elaboração de exames do Instituto de Línguas (Março, 2024).

A caracterização e a sequência descritas dos procedimentos metodológicos do estudo em questão são mais bem expostas na alternativa:

- a) Uso do programa VideoNote para a análise objetiva dos vídeos, referindo-se a aspectos da interação humano-gato visualizados em vídeo; Uso do sistema de captura de vídeo para gravar condutas visíveis dos olhares dos participantes da pesquisa; transcrição dos eventos em sua sequência temporal e unitária, com inclusão de gestos e atividades, com uso de uma combinação de métodos para codificar e resumir os dados, de forma a identificar ações que correspondem às etapas que estabelecem a dêixis nas transcrições.
- b) Uso do programa VideoNote para a análise objetiva dos vídeos, referindo-se a aspectos da interação humano-gato visualizados em vídeo ou ouvidos nas gravações; uso do sistema de captura de vídeo para gravar os olhares do participante gato; transcrição dos eventos em sequência temporal, com inclusão de gestos, sons e atividades, com uso do método de investigação naturalística para análise dos dados, identificando as ações dos participantes referentes às etapas de interação humano-gato.
- c) Uso do programa VideoNote para a análise objetiva dos vídeos e áudios capturados, referindo-se a aspectos da interação humano-gato visualizados e ouvidos em vídeo; uso do sistema de captura de vídeo para gravar os olhares e gestos do participante gato; transcrição dos eventos em sequência temporal, com inclusão de gestos, sons e atividades, com uso dos métodos de investigação naturalística e sistemática de textos para análise dos dados, identificando as ações dos participantes referentes às etapas de interação humano-gato.

QUESTÃO 08. “Um grupo nominal é uma estrutura linguística que consiste em uma palavra ou conjunto de palavras que funcionam juntas como um único elemento dentro de uma sentença. Geralmente, um grupo nominal inclui um núcleo, juntamente com modificadores e outros elementos que o acompanham para fornecer mais detalhes ou contexto.”

Texto redigido pela equipe de elaboração de exames do Instituto de Línguas (Março, 2024).

Considerando o processo de leitura de grupos nominais, observe abaixo as assertivas retiradas do texto e escolha a alternativa que apresenta as traduções corretas:

- I. **A selected set of interspecies communication acts between cats and humans** – Um grupo selecionado de atos de comunicação entre espécies entre gatos e humanos.
- II. **A linguistic-pragmatic analysis of cat-induced deixis in cat-human interactions** – Uma análise linguística de dêixis pragmáticas induzidas por gatos em interações entre gatos e humanos.
- III. **Deictic spatial reference towards food bowl in utility room** – Referência espacial dêitica em relação à tigela de comida na despensa.
- IV. **The interaction between so-called domestic cats and their humans in the shared home setting** – A interação entre os chamados gatos domésticos e seus humanos em um ambiente familiar compartilhado.

- a) Somente II está correta.
- b) Somente I e IV estão corretas.
- c) I, III e IV estão corretas.

QUESTÃO 09. Considerando o trecho abaixo retirado do texto integral, é possível afirmar que:

Salma has lived on a farm in a rural area in Norway since she was a kitten. She lives in a house with two adults receiving frequent visits from a grandchild, and is a very explorative, attentive, and communicative cat. In the two recordings we can observe the following: In the first recording, Salma is ten months old, guiding the human KME to the location where her food in a bowl is located, thus where she is typically fed (the utility room). The second recording is made when Salma is four months old. At that time, she had not been allowed outside the house except for short trips when kept on a leash.

- a) A participante felina é fêmea e se chama Salma, vive em uma casa de fazenda na área rural da Noruega desde filhote com dois adultos. É uma gata comunicativa e esperta. Na primeira gravação, Salma, com 10 meses, guia a humana KME para onde está sua tigela, na despensa.
- b) Trata-se de uma gata fêmea que viveu no campo e hoje se encontra em uma cidade da Noruega. Ela vive com dois adultos e uma criança, neta dos adultos. É uma gata comunicativa e atenciosa. Na segunda gravação, Salma, com 4 anos, pede para sair da casa para dar uma volta sem coleira.
- c) Salma é uma gata fêmea filhote, que vive com dois adultos em uma casa rural na Noruega. É uma gata atenta, medrosa, mas comunicativa. Nas gravações, Salma, com 4 e 10 meses, respectivamente, guia sua humana até a despensa para que coloque comida em sua tigela e pede para sair sem coleira, para dar uma volta.

QUESTÃO 10. Considerando as assertivas que tratam dos procedimentos metodológicos do estudo referentes à **coleta de dados**, podemos afirmar que:

- I. A coleta de dados foi feita através de gravações em vídeo e áudio de interações rotineiras entre uma gata (Salma) e dois humanos que compartilhavam o mesmo espaço.
- II. Uma das dificuldades apontadas sobre os participantes não-humanos é que nem sempre obedecem a comandos ou permanecem enquadrados na gravação.
- III. Dos 21 vídeos coletados, quatro foram selecionados e analisados qualitativamente a partir de uma análise interpretativa.
- IV. Somente dois vídeos foram selecionados, e as duas interações foram gravadas para propósitos científicos. A interação não foi modificada pelo princípio da reatividade.
- V. As gravações mostram Salma tomando a iniciativa, estabelecendo muito bem o espaço dêitico em um curto intervalo de tempo.

- a) Somente as assertivas IV e V estão corretas.
- b) Somente IV é incorreta.
- c) Somente I, II e III estão corretas.

TEXTO PARA A QUESTÃO 11

Public Health and Overpopulation: The United Nations Takes Action

*Sofia Scott, staff writer
Harvard International Review*



The global population is currently rising at a steady rate. The number of humans existing on Earth has never been as high as it is now. In 1800, Earth had approximately 1 billion inhabitants, which rose to 2.3 billion in 1940, then 3.7 billion in 1970, and approximately 7.5 billion today. In the last five decades, Earth has experienced an extreme population boom.

This phenomenon is known as overpopulation, where the condition in which the number of humans currently existing on Earth outstrips future resource availability and earth's carrying capacity. Throughout human history, birth and death rates have always counterbalanced each other, which ensured that Earth had a maintainable population growth level. However, in the 1960s, the global population increased at an unparalleled rate. This brought about a variety of apocalyptic predictions, most prominently, a revival of the Malthusian trap panic.

Paul R. Ehrlich's 1968 novel, *The Population Bomb*, eerily echoes Thomas R. Malthus's landmark 1798 *Essay on the Principle of Population*. Ehrlich's novel proposes theories regarding potential outcomes for when agricultural growth does not keep pace with population growth. Ultimately his theories say that the world's food supply will inevitably become inadequate for feeding the general population, whose numbers would continue to swell until famine, disease epidemics, war, or other calamities took root. These Malthusian predictions about out-of-control population growth have resulted in a variety of detrimental global impacts, particularly the emergence of extreme reproductive control measures, which have taken center stage on an international scale. Today, despite the fact that population scientists mostly agree that Malthus's forecasts were overblown, the lingering prevalence of these fears have contributed to millions of forced sterilizations in Mexico, Bolivia, Peru, Indonesia, Bangladesh and India, as well as China's two-child policy. Overall, this has left many wondering whether

extreme population growth projections are legitimate or merely groundless panic perpetuated by alarmists.

The Demographic Transition

In reality, rising birth rates and population booms are components of a four-step process called the demographic transition, which the Earth is currently undergoing. Most developed nations have already made this transition, but other countries are currently experiencing this change. Statistically, in the 1700s, women birthed four to six children. However, on average, only two survived to adulthood. When the Industrial Revolution began in Great Britain in the mid-18th century, the Earth experienced the most significant shift in human lifestyles since the Agricultural Revolution. The Industrial Revolution altered every aspect of society, and fostered a greater sense of global interconnectedness - many peasants became factory workers, manufactured products became widely available due to mass production, and countless scientific advancements improved existing methods of transportation, communication, and medicine.

Gradually, this economic development created a middle class and, after the work of union activists, ultimately raised the standard of living and health care for the impoverished labor demographic. The increased availability of better foodstuffs, sanitation, and medicine directly contributed to lower death rates, causing a population explosion that doubled Great Britain's population from 1750 to 1850. In the past, families tended to have more children because not all were expected to survive, but when child mortality rates decreased, the third transition stage was launched. This stage involves reduced conception rates and slowing population growth.

Even as birth rates have decreased dramatically, Earth's population is still rising at an alarming rate because the humans conceived during the population boom of the 1970s and 1980s are currently having more children; however, the current average number of children per family remains two and a half, while it was five during the late 1970s. As this generation ages, and its fertility diminishes, the rate of population growth will likely continue to decrease in every nation. Most of the world's countries have reached the fourth stage of the demographic transition. In approximately 80 years, developed countries will experience a reduction in fertility from over six children to fewer than three children. Malaysia and South Africa reached this point in 34 years, Bangladesh in 20 years, and Iran in 10 years.

Overall, most scientists postulate that human population growth will eventually come to an end, and the UN predicts that Earth's population will not exceed twelve billion. Some of the major causes of population growth are reduced infant mortality rates, increased lifespans, higher fertility rates, advances in science and technology, and improved access to proper medical care. With the UN's continued assistance, concurrent with overpopulation, the development level of the global community will increase, and the number of people living in poverty will decrease. Nonetheless, an ever-expanding human population is an immense social and economic challenge that necessitates the alignment of different national interests, especially with regards to reproductive rights, resource availability, and environmental concerns.

The United Nations Takes Action

In 1969, the United Nations Population Fund (UNFPA) was established in order to lead the UN in implementing population programs fundamentally based on the notion of family planning, or the "human right of individuals and couples to freely determine the size of their families" without governmental interference or legislation. The three most significant sections of the UN Population Fund mandate are "Reproductive Health," "Gender Equality," and "Population and Development." The United Nations Population Division (UNPD) works to confront the interconnected global issues posed by population growth, which is primarily fueled by rising fertility rates, increased longevity, and greater international migration. The UN produces the official demographic approximations and predictions for every country and all regions of the world. The UNFPA specifically addresses global population by compiling data and statistics regarding migration, fertility, marriage, regional development, urbanization, world population projections, and national population policies.

In November 2012, the UNFPA declared family planning a global human right; however, approximately 12 percent of 15 to 49-year-old women internationally are not afforded access to family planning. This is considered an egregious modern-day human rights infringement. The UNFPA aids various UN bodies like the Commission on Population and Development, and endorses the implementation of the Programme of Action undertaken by the International Conference on Population and Development (ICPD) in 1994. The UNFPA has been successful in urging international cooperation on the issue of securing family planning as a human right, pushing the UN to hold three conferences concerning the issue of population, along with two special sessions of the General Assembly and a summit in 2019.

The Way Forward

A broader global focus on guaranteeing family planning as a human right remains essential. In the words of economist Julian Simon, “Whatever the rate of population growth is, historically it has been that the food supply increases at least as fast, if not faster.” Since Ehrlich’s initial fear-mongering regarding an overpopulation-induced Armageddon, the planet’s population has more than doubled. However, annually, famine deaths have dropped by millions. Today’s famines are war-induced, not caused by natural resource consumption. As production rose, prices fell and calorie consumption increased, which decreased malnutrition worldwide. In Simon’s words, human ingenuity is the “ultimate resource.” Therefore, the enactment of heavy-handed population-control regulations is not only abhorrent, but is also irrational and unsupported by scientific evidence.

Fonte: Disponível em: <https://hir.harvard.edu/public-health-and-overpopulation/> Acesso em março de 2024. (texto adaptado)

QUESTÃO 11. *“O Fórum de Ciência e Cultura da Universidade Federal do Rio de Janeiro (UFRJ) atesta que a divulgação científica engloba desde textos jornalísticos que noticiam novas descobertas, o início de novas pesquisas ou reportam o trabalho de cientistas até a organização de uma exposição sobre algum tema de relevância científica e social. De extrema importância para a comunidade acadêmica, a divulgação científica é sempre feita por meios confiáveis, difundindo o trabalho acadêmico com uma linguagem mais acessível ao público geral, se assimilando a um texto informativo.”*

Fonte: Texto retirado do site do Fórum de Ciência e Cultura da Universidade Federal do Rio de Janeiro. Disponível em: <https://forum.ufrj.br/divulgacao-cientifica-o-que-e> Acesso em março de 2024.

Em até 20 linhas, redija um **resumo informativo** do artigo *Public Health and Overpopulation: The United Nations Takes Action* publicado no site de divulgação científica da Universidade de Harvard. Seu texto deverá conter as informações essenciais e termos-chave do artigo, dados estatísticos relevantes e apresentação das fontes-base mencionadas para a redação da publicação original. O caráter informativo pertinente ao gênero *divulgação científica* deve ser mantido. Lembre-se de que seu texto deve ser redigido em língua portuguesa no caderno de respostas, à caneta azul ou preta. Não faça tradução direta ou literal do artigo.