

Conservation psychology and the legacy of Carol Saunders for zoo and aquarium programs, networks, practices, and exhibits

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Abstract

Conservation Psychology created a dialog between environmental conservation and behavioral sciences. With an outsized influence by Dr. Carol Saunders, it started at Brookfield Zoo in Chicago exploring questions about the impacts of a zoo visit, and particularly how human behavior influences environmental outcomes for our planet. Here we explore how Conservation Psychology influenced the development of programs, exhibits and communities of practice at Brookfield Zoo and elsewhere in the zoo and aquarium world, and how eventually these applications changed the way modern zoos and aquariums operate. We present testimonials and review a handful of examples in which Conservation Psychology led to tangible programs, practices and wide professional networks at zoos and aquariums. These include an exploration of the future of zoos with George Rabb, followed by the legacy of nature play and the groundbreaking Hamill Family Play Zoo. Furthermore, we discuss how visitor studies at zoos and aquariums were influenced by Conservation Psychology, including the development of the Association of Zoos and Aquariums Social Science Research and Evaluation Scientific Advisory Group and two climate change education networks. We end with the development of tools, practices, and professional networks to explore empathy for animals. Most of these programs were envisioned or facilitated by Dr. Saunders, who was always a role model with an impact and a legacy that lives on.

KEYWORDS

aquarium, behavior change, Conservation Psychology, empathy for animals, nature play, Play Zoo, visitor studies, zoo

1 | INTRODUCTION

Like many emergent fields of cross-disciplinary knowledge, Conservation Psychology was born out of the need to bring a dialog to disciplines that shared complimentary areas of interest and lines of research and yet primarily communicated within their own realms.

The conversation between environmental conservation and behavioral sciences that led to the formation of Conservation Psychology was born at a zoo, with an outsized influence coming from Brookfield Zoo in Chicago. Then Brookfield Zoo director George Rabb had the idea of hiring a psychologist to evaluate education programs and exhibit performance. With a master's degree in psychology from the

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University of Virginia (1978), and a doctorate in behavioral biology from Cornell University (1988), Dr. Carol Saunders was well suited for this job. Immediately, she started asking much bigger questions about the role of zoos, the impacts of a zoo visit, and particularly how human behavior influences environmental outcomes for our planet.

Here we will not try to revisit how Conservation Psychology came about. Instead, we will reflect on the influence of Dr. Saunders and Conservation Psychology on the development of programs, exhibits and communities of practice at Brookfield Zoo and elsewhere in the zoo and aquarium world, and how these applications are changing the way modern zoos and aquariums think of themselves. To explore Dr. Saunders' influence and resulting applications of Conservation Psychology, we conducted a series of interviews and conversations, which we tried to summarize within the editorial confines of this paper. Thus, this is more a collection of personal memories and a bird's-eye retrospective than a detailed academic review. For more thorough accounts of the history of Conservation Psychology, readers should check Cranston (2013) or Kubarek et al. (2020). We probably missed some programs, as it was impossible to track everyone within Dr. Saunders' vast professional connections or follow the sprawling networks that have continued to expand during the last three decades, including her productive years at Antioch University. Along the way, we tried to present some of the vivid testimonials from those of us who worked with Dr. Saunders.

The list of program and networks influenced by Conservation Psychology and Dr. Saunders can be daunting. We therefore focus on a handful of examples in which Conservation Psychology led to tangible programs, practices and professional networks at zoos and aquariums. We start with Dr. Saunders' contributions with George

Rabb in the 1990s outlining the future of zoos. We will dedicate a significant portion to the Hamill Family Play Zoo, its applications, practices and the expansion of these practices through the NatureStart[®] Professional Development program. Furthermore, we will discuss how Conservation Psychology influenced visitor studies at zoos and aquariums as well as a research agenda, tools and practices focusing on the development of empathy for animals. Each of these programs was either directly initiated by Dr. Saunders or indirectly resulted from her influence. Most were projects of both local and national scale and scope, resulting in an impact and a legacy that lives on.

2 | THE FUTURE OF ZOOS AND "GEORGE RABB'S ARROW"

The confluence of Conservation Psychology and zoo philosophy was one of the recurring conversations and discussions between Dr. Saunders and Brookfield Zoo Director George Rabb. He originally had published these ideas (Rabb, 1994) with the now famous "Rabb's Arrow" that represented the evolution of zoological parks. Subsequent conversations with Dr. Saunders coalesced in their joint seminal paper (Rabb & Saunders, 2005), where they acknowledged the role of zoos and aquariums as conservation centers, but clearly delineated the need to understand the effect of animal experiences in advancing "harmonious and sustainable relationships with the natural world" (Figure 1). They also highlighted the need to better understand and measure care for animals, connections to nature and environmental engagement as important outcomes for modern

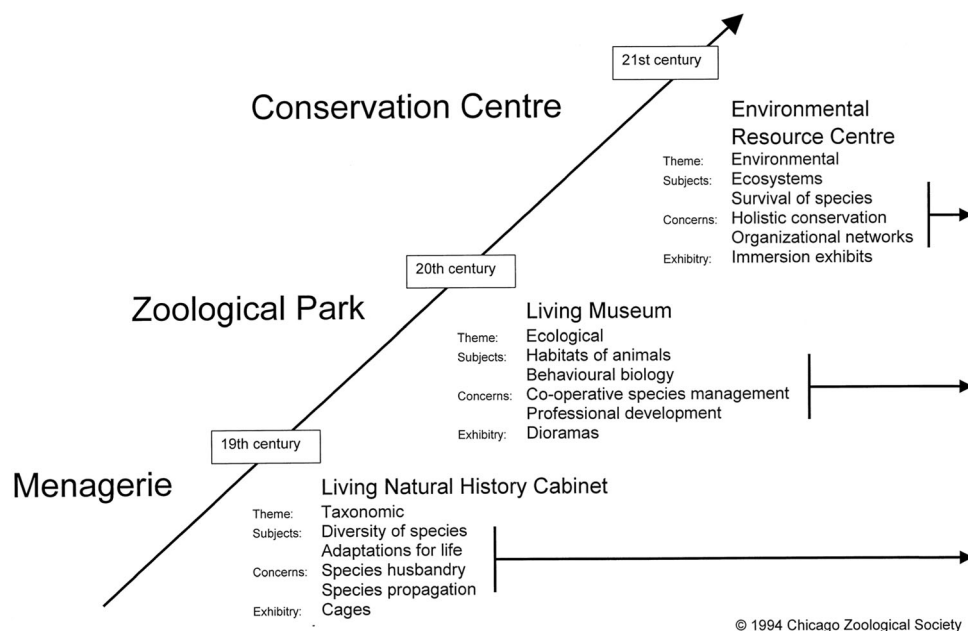


FIGURE 1 "Rabb's Arrow" succinctly described the history of zoos. The open arrow invited multiple interpretations and hinted at the growing role of understanding human behavior and social science to explore the relevancy of zoos and aquariums toward the 21st Century. Copyright 1994 CZS.

zoos and aquariums. This paper also delineated the critical role of emotions, affective feelings, early childhood experiences, caring for nature, empathy for animals, nature play and connectedness with nature. Each one of these visionary themes has become integrated into studies and applications regularly conducted today at many zoos, aquariums, museums and academic institutions.

In the early 1990s, these themes were primarily theoretical constructs whose application in the zoo and aquarium world were just beginning to be explored and implemented in practices. The Rabb & Saunders, 2005 paper took a decidedly humble approach against commanding a prescriptive conservation message, presaging the present discussions about equity, diversity and colonialism among zoos and aquariums. The paper also defined zoos and aquariums as centers of caring. Cynthia Vernon fondly remembers the delightful, if esoteric discussions with Dr. Saunders and George Rabb about the differences between “caring that,” “caring about,” and “caring for” components of conservation caring. These were among the first lines of thinking about the potential relationship between perceptions of animal welfare and visitor engagement in proenvironmental action. The paper took a decidedly optimistic approach about human behavior and encouraged zoos and aquariums to invest in institutional change as a means for creating social change for conservation.

While this paper may have been initially perceived as an academic contribution, in reality, it sent shockwaves across the zoo and aquarium world. It affected how zoos and aquariums see themselves and their role in society. Subsequently, many zoos and aquariums changed their mission statements to explicitly include the words “conservation” and “care” (Luebke & Grajal, 2011; Patrick et al., 2010). “Rabb’s Arrow” also influenced how zoos and aquariums measure their impacts. A wider emphasis on measuring perceptions, emotions and values in zoo and aquarium visitors displaced a narrow-minded emphasis of pedagogical education programs focused solely on science literacy or conservation content. As a result, most zoos and aquariums have changed their educational models from pedagogical delivery of information to a constructivist perspective of zoos and aquariums as free-choice learning environments (Ballantyne & Packer, 2006).

The need to recognize behavior change, understanding of science and particularly the visitor experience, launched several additional lines of research, most prominently the multiyear, multi-institutional study “Why Zoos and Aquariums Matter” (Falk et al., 2007; Fraser & Sickler, 2008; Fraser & Switzer, 2021). This multiyear research project has influenced how zoos and aquariums understand their relationship with their visitors and their potential as agents for social change. This project also inspired the development of audience research teams at many zoos and aquariums, which have developed and advanced methods, tools and measures for visitor perceptions, science literacy and program evaluation. Moreover, this proliferation of audience research teams nurtured an informal network of Conservation Psychology researchers, practitioners and evaluators who were regularly crossing paths at conferences of the Visitors Studies Association and the Association of Zoos and Aquariums (AZA). The eventual result was the AZA Social Science Research and Evaluation Scientific Advisory Group, which continues

to promote and disseminate methods, tools and research results across AZA institutions.

Similarly, the field of measuring and defining “connectedness with nature” became increasingly relevant for zoos and aquariums to explore a potential causal relationship between nature experiences and proenvironmental behaviors (Chawla, 2020; Salazar et al., 2020; Tam, Lee, et al., 2013). The measurement of preconceptions, values, demographics, personal narratives and emotions have become more widespread to better understand visitor personal motivations toward proenvironmental attitudes and actions.

These measurements and tools were used in the 2010s by zoos and aquariums to better understand public awareness, perceptions and narratives about climate change and to design more effective climate change education practices. For example, the Climate Zoo Education Network (CliZen), a consortium of AZA-accredited zoos (Clayton et al., 2014; Luebke et al., 2012), used standard audience segmentation from the national “Six Americas” polling methodology (Leiserowitz et al., 2010). This segmentation analysis was combined with Conservation Psychology factors, such as connectedness with nature, perceptions about animals and environmental engagement. A large national survey showed that zoo and aquarium visitors were significantly more aware and concerned about climate change than the general public in the United State (Kelly et al., 2014). Concurrently, the National Network for Ocean and Climate Change Interpretation (NNOCCI), a consortium of zoos and aquariums, studied how framing environmental narratives can influence personal understanding about climate change (Geiger et al., 2017). Using these results, NNOCCI designed educational resources and nurtured a national leadership training program at zoos and aquariums using principles of Conservation Psychology, message framing and free-choice learning (Swim et al., 2017). In most of these initiatives, Dr. Saunders continued to be involved, either as a formal or informal advisor.

Even in her final years, Dr. Saunders continued to be extremely generous with her time, intellect and insights. Jerry Luebke felt that Dr. Saunders was a strong role model and mentor when he joined her Brookfield Zoo team in 2002. And when Dr. Saunders left the zoo, she deposited several bookshelves of internal evaluation reports, references, memoirs, and notes from previous events and symposia. Similarly, Kathy Wagner, previously with the Philadelphia Zoo, did not know much about Conservation Psychology until Dr. Saunders invited her to one of the initial conferences in the late 1990s. She met influencers like John Falk and Lynn Dierking, as well as zoo practitioners like Cynthia Vernon, then Curator of Education at Brookfield Zoo. “Dr. Saunders was both a gentle instigator and a role model,” said Wagner. “It redefined my role at Philadelphia Zoo to better understand visitor behavior and motivations.” Kathy Wagner recalls an email from Dr. Saunders, a few months before her death, apologizing for her late reply, and then continuing to add nearly a page of annotated bibliographic references related to a question that Wagner had sent on Conservation Psychology. Everyone felt that Dr. Saunders was extremely generous with her time and advice, a role model and a leader who never made anyone feel underappreciated or irrelevant. We are all grateful for that.

3 | AN EARLY APPLICATION TO ZOO EXHIBITS

One of the first applications of Conservation Psychology to a zoo exhibition—“Quest to Save the Earth”—was conceived, developed and implemented at Brookfield Zoo by Dr. Carol Saunders. The experience was constructed outdoors, at the exit from Tropic World and drew visitors in with its clever graphics and promise of a fun, family-oriented adventure. Cynthia Vernon remembers how focused Dr. Saunders was on creating an active experience for zoo visitors that rewarded collaboration among the game players, encouraged creative problem solving and used principles of Conservation Psychology to spur players to proenvironmental behaviors back at home. “Dr. Saunders had so many playful ideas and we spent hours and hours testing them on zoo staff and visitors. It foreshadowed a lot of what was used later on in rethinking the Children's Zoo (which became the Hamill Family Play Zoo) and used principles of Conservation Psychology like having to work collaboratively to open a door and publicly pledging to commit to a pro-environmental behavior.”

4 | HAMILL FAMILY PLAY ZOO AND NATURE PLAY

During the interviews for this paper, the Hamill Family Play Zoo was repeatedly highlighted as one of the most influential and enduring applications of Conservation Psychology. It was an idea nurtured and explored by Dr. Saunders and a cohort of designers, builders, researchers, and practitioners. Its legacy continues to this day.

Several years before the opening of the Hamill Family Play Zoo, Dr. Saunders, with support from George Rabb, held a series of symposia around two major questions: (1) What are the childhood roots of conservation behavior? (2) Can we apply these findings to a children's zoo environment? The importance of childhood experiences with animals and nature through free play and exploration emerged as a critical pedagogical design principle, along with the vital importance of intergenerational support. These pedagogical design principles, grounded in Conservation Psychology research, became the foundation for the design of Hamill Family Play Zoo and continue to be the center point of educational practices utilized there. These meetings during the second half of the 1990s turned Brookfield Zoo into a think tank where people from varied disciplines crossed intellectual paths, explored hybrid fields and discovered joint interests.

Louise Chawla, one of the early thinkers about childhood development and nature play, attended several of these sessions and continued to visit Brookfield Zoo in subsequent years. “It was an exciting and wonderful time,” recalls Chawla about the initial workshops and the design process for the Hamill Family Play Zoo. “The teams included people like David Sobel, Gene Myers, Robin Moore, Peter Kahn, and Nel Noddings. Sobel and Kahn were writing essays on children and nature; Myers was exploring caring attitudes

toward nature. Noddings was developing the ethics of care. I was developing my own research on nature and play (Chawla, 2007). Collectively, we had the ability to lean on MIG (the chief design architects for the project) to take our scholarly approaches and academic ideas and turn them into practicable designs. Robin Moore and Nilda Cosco played a key creative role in those translations. It was an exhilarating process, and the credit goes to Dr. Saunders and George Rabb for making it all happen.” The Hamill Family Play Zoo was also among the first (and still one of the few) zoo exhibits designed around principles of Conservation Psychology, as opposed to the more traditional zoo designs based on zoogeographic, taxonomic, or habitat conservation themes.

Since it opened in 2001, the Hamill Family Play Zoo has received millions of children and their families with the aim of helping them develop caring attitudes, life-long proenvironmental identities and attitudes, and empathy toward animals and nature. Play has been clearly identified by experts as a critical developmental phase in early childhood, and as such, has a vital role in the Hamill Family Play Zoo's child-centered approach to learning. “But play at the Hamill Family Play Zoo wasn't play for play's sake” says David Becker, who has had a core leadership role within the Hamill Family Play Zoo since 2001, “it was play with the objective of developing empathy and caring attitudes toward animals and nature.” Whether it was preparing banana leaves to feed the gorillas; pretending to be a veterinarian in the Play Zoo's hospital; imitating a jumping lemur (dressed as a lemur); planting a garden; examining a stuffed bear toy with a stethoscope; comparing animal X-rays; releasing ladybugs; pretending to be an animal keeper; building nests from sticks; pretending to be zoo director or creating mud shelters, the Play Zoo pioneered the practice of family nature play as a key process in developing life-long positive attitudes toward nature and animals.

Once opened, the Hamill Family Play Zoo imposed previously unexplored operational challenges such as how to nurture play and the role of adult facilitators and families. During the early 1990s, Roger Hart, Robin Moore and others promoted the ideas of “play work” (Benjamin, 1976), mostly emanating from Europe. This model was incorporated into Play Zoo programming and created a solid framework for the inclusion of children in decision-making, the role of play, and how adults can facilitate (as opposed to structure or direct) play in a way that nurtures and develops children's agency and identity. These ideas were among the selective criteria for hiring a workforce of “Play Partners” that operated the Hamill Family Play Zoo. David Becker recalls these conversations as part of his interview process for the job of Manager of the Hamill Family Play Zoo. “I did not know much about Conservation Psychology,” recalls Becker, “but the possibility of exploring childhood connections with nature and developing empathy for animals was extremely appealing.” During the first opening years of the Hamill Family Play Zoo, Dr. Saunders continued as a quiet but persistent presence in the development of operational principles. David Becker recalls that Dr. Saunders regularly participated in team meetings, and invited Louise Chawla, Gene Myers and others nearly every year to visit the Hamill Family Play Zoo. During this time, “we were learning on the fly,” remembers

David Becker fondly, “but with expert guidance from Drs. Saunders, Chawla, Myers and others, we continued to refine operations and practices.” The application of role-play, unstructured games, and empathy for animals seems normal today, but it was a pioneering effort when the Hamill Family Play Zoo started. Play Partners developed a way to interface with the youngest visitors and their families. After more than 20 years, these principles remain unbroken: a consistent operational approach to facilitate empathy for animals and develop early childhood identities toward animals and nature.

Nearly from the beginning, the Hamill Family Play Zoo became a destination where many zoo designers and practitioners came to emulate, copy or learn. Its exhibits were replicated and augmented in many other zoos, aquariums, botanic gardens, science centers, parks, and museums. Some of these institutions tried to operate these exhibits without continuous staff facilitation. However, it became evident that play exhibits by themselves are not fully effective without a deep understanding of early childhood mental and physical developmental processes and how this development should influence site designs. Robin Moore and Nilda Cosco at North Carolina State University developed this idea into the Natural Learning Initiative (naturalearning.org), a multidisciplinary program that provides graduate degrees, professional development, and project guidance for nature play areas. Similarly, the contributions of professionally trained Play Partners were often a critical component of successful nature play facilities. From the beginning, it became evident that the success of the Hamill Family Play Zoo was more reliant on the “software” than the “hardware.” In the mid 2010s this team, led by Marilyn Brink and other Play Partners, developed another unexplored hybrid field between two communities of practice with few connections. One was early childhood education practitioners, such as day care professionals and early childhood educators. The other was environmental educators and zoo interpreters. The result was the creation of the NatureStart[®] Professional Development program offered through the Chicago Zoological Society, which combined the theoretical understandings of Conservation Psychology, early childhood development, play, empathy for animals, and connections to nature, with the practical lessons learned by Play Partners during the previous 10 years at the Hamill Family Play Zoo. This effort reinforced the idea that nature play does not require fancy zoo exhibits, as it can be effectively developed at an urban environmental center or a day care facility. With an emphasis on front-line practitioners, the NatureStart professional development program provided a successful training curriculum for educators in zoos, aquariums, museums, nature centers, and early childhood programs nationally and internationally (available at: <https://www.czs.org/NatureStart>).

Recognition of the importance of nature in the lives of children became further popularized in 2005 with Richard Louv's landmark book “Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder.” Louv took many of the early findings from experts in children's relationship with nature and sternly warned society about the detrimental developmental effects of losing connections with nature. These ideas expanded at AZA zoos and aquariums,

including the Disney-supported AZA grant program “Nature Play Begins at Your Zoo & Aquarium” and AZA's Nature Play Task Force, in coordination with Louv's Children & Nature Network. The result is that nature play has moved decidedly to the mainstream of zoo and aquarium operations and practices. In some way, a large portion of this thinking was facilitated by those initial exciting workshops at Brookfield Zoo and the myriad professional and personal connections that hatched during those nascent development years of the Hamill Family Play Zoo.

5 | EMPATHY FOR ANIMALS

Zoos and aquariums afford unique and highly personal interactions with a wide diversity of animal species. While this seems to be a redundant commentary, its analysis from the point of view of Conservation Psychology showed that many visitors had the ability to sense the needs and perspectives of zoo animals. These visitor empathic perspectives became an exciting area of research and applications to explore a potential relationship between feelings of empathy for animals and proenvironmental behaviors. Empathy for animals was identified as one of the leading affective responses during zoo or aquarium visits, whether in the efforts by Play Partners in modeling empathy for animals or in developing interpretation practices for interpreters or educators. As empathy is the ability to take the perspective of another creature (or person), it incorporates three distinct but connected abilities—*affective empathy*, *cognitive empathy*, and *empathic concern*. However, the measurement of empathy responses in visitors and how to frame animal encounters were in need of further development.

During the late 2010s, a number of Conservation Psychology studies started to define the methods to measure empathic responses during animal encounters, as well as the potential relationships between empathy for animals and proenvironmental intentions or behaviors (Tam, 2013; Young et al., 2018). With encouragement from Dr. Saunders, a number of evaluators and researchers—Kathryn Owen, Jerry Luebke, Kathayoon Khalil, and Jim Wharton—took an early lead on these studies and developed tools and practices to understand and facilitate empathetic responses to zoo and aquarium animals. These tools and practices have led to changes in how animals are presented, particularly in the case of ambassador or program animals (e.g., Minarchek et al., 2021). It also widened the acceptance among zoos and aquariums in using anthropomorphism as a valid frame to explore empathic responses toward animals (e.g., Akerman, 2019).

Empathy for animals has since inspired valuable lines of research, tools and practices (Khalil et al., 2020) at zoos and aquariums, as it may be an important precursor to caring behaviors and an affective motivator of proenvironmental behaviors. These findings have now expanded with the creation of formal and informal networks of practitioners and researchers, which has become a regular appearance at AZA conferences for the last few years. As an example, the advancing conservation through empathy for wildlife (ACE) for

Wildlife Network, a network of twenty AZA-accredited zoos and aquariums, has held two symposia on empathy for wildlife, creating yet another community of researchers and practitioners advancing empathy in their programs, practices and experiences (Brinkley, 2021; Johnson, 2020).

6 | FUTURE DIRECTIONS FOR PROGRAMS AND PRACTICES IN CONSERVATION PSYCHOLOGY

As presented elsewhere in this special issue of Zoo Biology, there are multiple and promising areas for expansion in Conservation Psychology. Through our interviews, we asked what areas for programs or practices require attention. The COVID-19 pandemic has changed many assumptions about our society. Together with the deep economic and public health upheaval, the last 2 years have seen an emerging quest for social and racial equity as well as a worrisome political polarization in the United State and other countries. Discussions about zoos and aquariums developing stronger conservation action guidance and outcomes are just starting (Maynard et al., 2020, 2021). Yet despite the terrifying ride through the pandemic, most zoos and aquariums have experienced an outpouring of community support from visitors and donors. The pandemic has forced people to keenly ask what matters to them, and what causes are relevant. More than ever, zoos and aquariums are perceived as an essential part of local communities. As places of respite, hope, and reflection. Places to connect with our loved ones, and to connect with nature and animals. And while collectively zoos and aquariums are significant supporters of biodiversity conservation worldwide (Moss et al., 2014), the public is also demanding concerted attention to issues of justice, diversity, equity, and inclusion. Furthermore, communities are asking zoos and aquariums to pay deeper attention to the emerging issues of our time: climate change, environmental justice and the extinction crisis. All these themes have deep connections to human behavior. Conservation Psychology can and has provided deep insights into these connections. As zoos and aquariums rebuild after these uncertain times, they should emphasize their value as agents of social change, both for global biodiversity conservation and as an integral part of the social contract with their communities. The communities surrounding zoos and aquariums have given a strong vote of confidence and support to their mission and their role in advancing social change. Dr. Carol Saunders always advocated for an urgent need to change this world toward more “harmonious and sustainable relationships with the natural world.” Zoos and aquariums should waste no time in taking up this challenge.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

Data sharing not applicable to this article as no datasets were generated or analyzed during the current study.

ETHICS STATEMENT

The authors declare that this manuscript is not published elsewhere. All coauthors meet criteria for authorship and the manuscript provides the appropriate acknowledgments for all participants. The authors did not receive dedicated funding for this manuscript. The production of this manuscript did not require any ethical approvals or informed consent from research subjects.

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