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Perspective

Re-evaluating the notion of value in wildlife trade research from a service marketing perspective

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ABSTRACT

The trade in wildlife and wildlife products is one of the leading causes of population decline for thousands of species. It is critical that researchers use all available theories and techniques at hand to tackle this conservation crisis. Here, we integrate current services marketing theory with our existing understanding of behaviour change in wildlife trade research and propose future areas of transdisciplinary research. We first used the Preferred Reporting Items for Systematic review and Meta Analysis methodology to perform a systematic literature review of 227 articles from 76 journals to explore the current understanding of value in wildlife trade literature. Our results showed over 90% of articles used the term value to describe monetary worth and no articles provided a definition or justification of this use. We then contribute to scientific discourse by presenting Service Dominant Logic from marketing theory as a novel lens through which to explore consumer behaviour and the concept of value in the wildlife trade. We outline future avenues of research that will improve the ability of conservation practitioners to create meaningful behaviour change and system transformation using a wholly novel conceptualisation that synthesises the two disciplines of marketing and conservation.

1. Introduction

The global wildlife trade is recognised as a significant threat for thousands of species of plants, animals and fungi around the globe (Scheffers et al., 2019; UNEP-UNICRI, 2018). Due to the nature of the crisis, much work has been done to try to identify key strategies that can be used to reduce the impact of trade on population numbers, including consumer demand reduction, legal regulation, policy change and incentives for hunters to cease their practices (reviewed by Phelps et al., 2016). Additionally, trans-disciplinary work has introduced theories and analysis techniques from the field of social anthropology, criminology, political science and economics (Blair et al., 2017; Leberatto, 2016; Thach et al., 2018). Many of these works aim to address knowledge gaps in methodology or analysis. There continues to be a dearth of such collaboration when it comes to sharing theoretical perspectives that have the potential to shift our approaches and ways of thinking around such a critical and complex problem.

Wildlife trade is inclusive of all legal and illegal plant and animal trades including, forestry products, live animals, specimens and parts, and objects made of animal products (Broad et al., 2003). Despite this broad definition, a review of wildlife trade practices and policies found that much of the discourse has focussed on the illegal wildlife trade (IWT), aiming to create political, legal and social structures that prohibit the hunting, sale and transport of protected species (Cheng et al., 2017). Arguably one of the most widely recognised set of regulations are those linked to the three appendices of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). This Convention provide the strongest protections for species threatened by international trade and asks all parties to recognise "the ever-growing *value* of wild fauna and flora from aesthetic, scientific, cultural, recreational and economic points of view". Concurrently, trade research often identifies so-called high-value species as the most vulnerable to trade (Challender and MacMillan, 2014; Nijman et al., 2011; Symes et al., 2018). Our understanding of value therefore has direct implications for our decision-making in the protection of species. While species rarity or population numbers can be quantified through observation and extrapolation, determining which species should be considered high value or of special importance is a considerably more complex and

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nuanced task.

Within the broader conservation and ecology disciplines, the concept of *value* has been used to frame the discussions around ecosystem services and resource sharing. Perhaps the most notable example is the work of the United Nations Convention on Biological Diversity (CBD). Initially ratified in 1992, and subsequently extended at later meetings, the CBD is an international agreement on the governance of access to, and use of, biological resources and ecosystem services (United Nations, 1992; Neßhöver et al., 2015). Within the first paragraph of their preamble, the policy states that contracting parties must be "conscious of the intrinsic value of biological diversity and of the ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values of biological diversity and its components" (United Nations, 1992). These categories provide helpful insights on the different uses of biological entities and their associated social meanings and show a clear understanding of the nuance in value attribution. We propose that the creation of distinct silos of *value* has yet to explain fully the complexity and uniqueness of value to individual consumers. We therefore present a theoretical perspective from the Services Marketing discipline as a framework from which to start this process.

Services Marketing is a sub-discipline of marketing that focuses specifically on relationships and the creation and exchange of value within exchange systems (Fisk et al., 1993). Over time, the concept of value has taken on several iterations that have transformed how we think about the trading process itself (Baron et al., 2014). Initially, value was seen as the utility assigned to a product by its producer or supplier, known as its value-in-exchange. This is the form of value most closely linked to a sales price. In their seminal work in 2004, Vargo and Lusch introduced the concept of Service Dominant Logic (hereafter SD Logic), and with it, popularised the idea of value-in-use, the idea that, until the consumer applies his or her own resources to gain a particular service from a product, the value has not been fully created. They suggest that producers can only make value-propositions and it is ultimately up to the consumer to determine the final value. In other words, the price a consumer is willing to pay is only a reflection of the amount of benefit they perceive they will gain from using the product.

Following this, in 2010, Vargo and Lusch revised this concept further to value-in-context, broadening the term to encompass the way value is contextually specific and dependent on the integration of specific resources under different circumstances (Vargo et al., 2010). Vargo et al. (2010) offer the following explanation – *"Consider the purchase of a new car. The price paid for the car is the value-in-exchange; the benefits from the use of the car represent the value-in-use. But that value is contingent on integration with other resources (driving ability, maintenance, fuel, roads) and the use context – for example, integrating a car with family activities, such as weekend soccer games, establishes a different value-in-use from integrating it with individual needs, such as a daily commute"* (p. 141). Finally, Edvardsson et al. (2011) contended that all value is a social construction that depends on social structures - that is, the rules, symbols and resources that govern social interactions, meanings and behaviours. This evolution in thought has not only contributed to theory but has provided much opportunity to explore the nature of marketing relationships and to understand the processes by which a consumer and vendor create value within transactions. Consider a diamond ring inherited from a deceased relative, used as an engagement ring and then sold after an acrimonious divorce. During the period of ownership, it has not changed in sale price nor aesthetic appeal, yet its symbolic value is likely to have changed drastically over time.

In this paper, we first conduct a systematic literature review to determine the current understanding and usage of the concept of the value of wildlife and wildlife products in trade literature (Section 2). In the following section, we introduce the theory of SD Logic from Services Marketing literature in Section 3 and apply each of its five core axioms to the study of consumer behaviour and the concept of value in wildlife trade research (section 4). Our final section synthesises our findings and proposes several avenues for future research that address the critical question facing conservation practitioners today (Section 0). How can we understand and eliminate the social structures that tolerate and maintain wildlife trade practices to create meaningful behaviour change?

2. Our current understanding of value

Following the Preferred Reporting Items for Systematic review and Meta Analysis (PRISMA) statement and procedures outlined in Moher et al. (2009) we conducted a systematic search to identify articles on wildlife trade that discussed the concept of wildlife product value (Appendix A). Four databases were searched using the keywords *wildlife AND trade AND value** and all review and research articles published in English between 2010 and 2020 were extracted ($N = 631$). We classified each scientific journal into one of nine categories by using the first field referenced in their 'Aims and Scope' section of their main website. These categories were then used to determine what journal types were more likely to publish articles discussing wildlife trade value in order to determine whether particular journal types are more likely to publish articles on the value of wildlife trade or not. The variance within the number of articles retrieved from each database is due to variation in size and relevance of each database to the target search terms (Table 1).

We then downloaded and collated all records using the EndNote X8 software and duplicate articles were removed ($n = 223$) to give a set of 408 unique articles. We reviewed all article titles and abstracts and applied exclusion criteria to remove articles limited in scope to the following: subsistence-only hunting and farming, legal extraction of timber forest products, physiological or biological species traits, land-use management, ecosystem services or disease transmission ($n = 220$). We next imported all complete articles into the qualitative analysis software NVivo 12 and applied exclusion criteria to the full article text and searched a final dataset of 181 articles from 65 journals for references to value. Finally, we searched the references of the papers to find any additional relevant articles we had missed, resulting in a dataset of 227 articles from 76 journals (Table 1, for a full list of articles see Appendix B). We understand that it is likely that some articles were missed; however, we have done our best to ensure a representative sample of the literature.

We explored the texts to find any definitions of consumer value presented by authors and found no examples where value had been specifically defined by the authors. Alternatively, we used the text search function in NVivo 12 to examine the texts for all descriptors used in association with the term value and created nodes for each classification of value as used by the authors. We coded synonyms together (for example monetary, financial and market values were all coded under Economic) and created the following codes to represent all possible classifications in the text: Economic (Value-In-Exchange), Rarity, Medicinal, Nutritional, Ecological, Educational, Aesthetic (Value-In-Use), Socio-Cultural and Intrinsic (Value-in-Social-Context) (see Table 2 for illustrative examples). These classifications are largely cohesive with the value types acknowledged by the CBD, but key differences are the addition of 'medical', 'nutritional' and 'rarity' values, and the omission of 'genetic' value. Any other differences are predominantly semantic. Furthermore, Table 2 highlights that value classifications often add little meaning or clarity to the core beliefs or actions undertaken by consumers. Indeed, the nuance in human behaviour and belief are such that often, value classifications varied highly across the literature, with one paper describing *intrinsic value* as the "taste" of bushmeat (as in Table 2), yet another describing it as the "symbolic national status [and] inherent worth" of the vicuña (Wakild, 2020). We propose that this clustering of complex concepts risks a low-resolution view of consumer behaviour. By dissecting value in greater detail we can gain a more comprehensive picture of the factors that influence choice preferences and decision-making. Note that we restricted our search to the value of the product to the trade participants and discussions limited to the value of the species to conservation were therefore not included in the study.

Table 1
Shows each step of the literature review process. Forwards/Backwards refers to articles found by checking for of all papers cited within, or articles that cited, previously returned papers.

Database	Articles retrieved	Journal scope (showing top 8)	No. of journals	Journals (showing top 8)	No. of articles
Level 1 →		Level 2 →		Level 3	
SCOPUS	207	Cross-disciplinary	14	Biological Conservation	54
Web of science	282	Conservation	11	Global Ecology and Conservation	31
ScienceDirect	112	Social science	11	Marine Policy	14
Agricola (OVID)	30	Taxon specialist	9	Oryx	9
Forwards/backwards	46	Biology	8	Conservation Biology	8
		Environmental management	8	Biodiversity and Conservation	7
Total downloaded	676	Ecology	7	Ecological Economics	7
		Natural Science	7	PLoS ONE	7
		Total journals	76	Total articles assessed	227

Table 2
Here we demonstrate how we defined each value classification by providing example quotes from the literature review.

Value type	Illustrative examples from the literature
Economic value	*"With respect to the monetary value of the trade in live eels, two types can be recognised…The first one comprises the trade of live eel valued at around US$12 / kg…The second one comprises trade exclusively to East Asia that commenced in 2009 with eel valued at around US$185 / kg*" (Nijman, *2017*)
Medicinal value	"*In Vietnam, primates are hunted for food or medicinal purposes, and it is a common occurrence to find them in bottles in alcohol, not as zoological specimens but as tonics for their medicinal value*" (Alves et al., *2010*)
Aesthetic value	*"Today, possessing an ivory carving, especially high end ivory, gives owners a sense of prestige (or 'face'). Third, carvers and collectors cherish ivory for its cultural and aesthetic value as historic fine art."* (Gao and Clark, 2014)
Ecological value	"*In the focus groups, ecological values of wildlife species were dominated by negative perceptions of wildlife species as vectors of zoonotic disease or sources of physical damage to natural resources such as water."* (Kahler and Gore, 2015)
Educational value	"*We found that ecological, cultural and aesthetic, and scientific and educational value were considered the top three with regard to the value of tigers, and medicinal and edible value was considered the lowest.*" (Liu et al., *2015*)
Nutritional value	"*Pangolin meat is consumed as a luxury product in urban metropolises in East and Southeast Asia [] and valued as bush meat in African range states*" (Ullmann et al., *2019*)
Rarity value	*The AAE is a theoretical framework that suggests that people place disproportionate values based on species rarity []. This cycle of exploiting rare species for collection, which in turn leads to an increased perception of rarity and value, and ultimately, leads to an accelerated extinction risk for species* (Siriwat et al., *2019*)
Socio-cultural value	"*Anthropologists and ethnoecologists have studied the cultural values of hunting [] emphasizing the important cultural role that the hunting and sharing of wild meats (which may include terrestrial and marine species of conservation interest) plays in the transmission of traditional ecological knowledge.*" (Delisle et al., *2018*)
Intrinsic value	"*price can vary remarkably across bushmeat species because of their intrinsic value* (i.e. *taste) and independently on the weight of the sold meat.* "(Luiselli et al., *2017*)

Our results showed that of the 227 articles, 91.6% of them used the term value to reflect a financial benefit or price ($N = 208$). The next most commonly used classification was socio-cultural value, which was referenced in 23.4% of the articles ($N = 53$). Only 39.2% of articles included multiple value classifications within their work ($N = 89$), while 57.7% referred to value exclusively in terms of financial benefit ($N = 131$). Only one article exclusively referred to aesthetic value (Burivalova et al., 2017); four articles exclusively referred to socio-cultural value (Chapman and White, 2020; Davis et al., 2020; Liu et al., 2020; Xing et al., 2019); one article exclusively referred to intrinsic value (D'Cruze and Macdonald, 2016); and two articles exclusively referred to medicinal value (Gbogbo and Daniels, 2019; Gomez and Shepherd, 2018). All studies that discussed ecological, educational, nutritional and rarity value discussed at least one other classification of value as well.

Overall, there was a clear increase in the number of articles over time, however the relationship between the number of articles that referred to value as 'Financial Value' remained relatively stable one-and-a-half and two-and-a-half times more than all other value types combined (see Fig. 1). These data highlight that the understanding of the concept of value remains skewed towards value-in-exchange where the worth of wildlife or wildlife products is measured by their sale price. Additionally, the lack of any clear definitions of value within the articles may mask the complex and unique relationship that individual communities have with value concepts.

Definitions would also ensure that readers and authors who are non-native English speakers or are from different cultural backgrounds do not understand value concepts differently. It is for this reason that we feel that the SD Logic theoretical framework provides an opportunity to reassess the way that value is understood within the wildlife trade. In the next section, we will outline the framework and its proposed application to the field.

3. Redrawing the roadmap using SD logic

A rudimentary understanding of economic theory would hold that goods and services are either bartered or exchanged for money in transactions that form the basis for all markets. This illustrates the traditional Goods-Dominant Logic (GD Logic) approach that proposes that a firm creates a product and designs it with a specific utility and value (Smith, 1776). The product is then exchanged or bartered with a consumer and the transaction ends. According to Vargo and Lusch (2004) GD Logic has five main tenets, three of which are relevant here –.

1. The purpose of economic activity is to make and distribute things that can be sold.
2. To be sold, these things must be embedded with utility and value during the production and distribution processes and must offer to the consumer superior value in relation to competitors' offerings.
3. The firm should set all decision variables at a level that enables it to maximize profit.

Under this logic, goods and services are two separate entities and more than 50 years ago, Rathmell provided the following definition between the two, "consider a good to be a noun and a service a verb - a good is a thing and a service is an act. The former is an object, an article, a device, or a material … whereas the latter is a deed, a performance, or an effort" (Rathmell, 1966). This clear binary between 'goods' and 'services' remains the generally held belief among non-marketing scholars and continues to be an accepted theory today (Fisk et al., 1993; Shostack, 1977). However, academics began to reject this idea (Grönroos, 1994) and subsequently Vargo and Lusch (2004) introduced the new SD Logic framework, which sought to reframe the unit of exchange from goods to service. Through peer review and collaboration

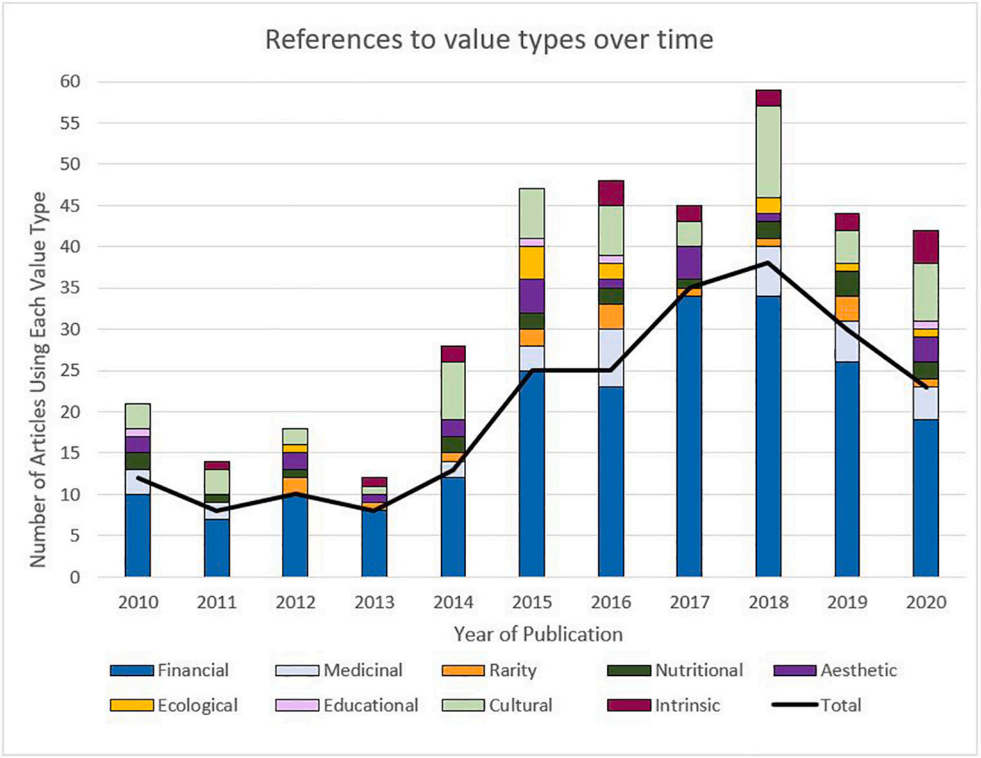

Fig. 1. The trends in value classification use in conservation literature over time. We identified the number of journal articles that referred to each value classification and mapped them against the year the article was published.

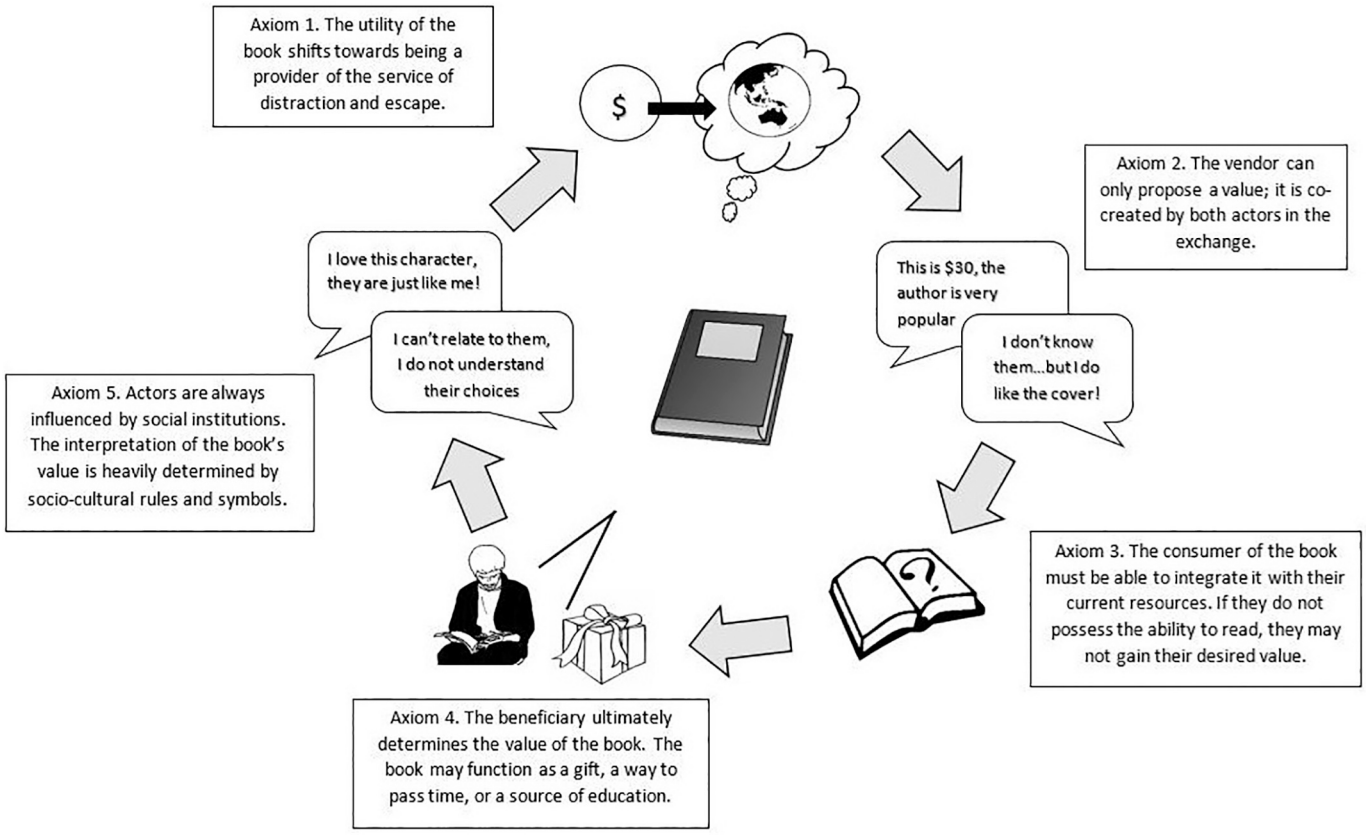

Fig. 2. A graphical demonstration of the SD Logic framework. We provide an Illustrative example of how the axioms of SD Logic can alter the perception of value of a product, in this case, a book.

this theory was developed and revised until they released the final five axioms for SD Logic as follows (Vargo and Lusch, 2016; Vargo, 2018).

1. Service is the fundamental basis of exchange.
2. Value is co-created by multiple actors, always including the beneficiary.
3. All social and economic actors are resource integrators.
4. Value is always uniquely and phenomenologically determined by the beneficiary.
5. Value co-creation is coordinated through actor-generated institutions and institutional arrangements.

Axiom 1. Service is the fundamental basis of exchange.

The basic concept of the SD Logic framework is that instead of viewing a transaction as a vendor providing a physical good to exchange with a consumer, they provide a service or an application of resources for the benefit of others (Vargo and Lusch, 2017). An illustrative example would be that in GD Logic, the purchase of a book (the good) is a simple transaction, with the book being the unit of exchange. However, in SD Logic this would be reframed as a customer buying the book as a vehicle through which they access the *service* of distraction and inspiration (Edvardsson et al., 2011, see Fig. 2). This may sound like a simple case of semantics; the change creates a shift in worldview that fundamentally alters the perspective of markets and provides potential for reframing the study of wildlife trade.

Through this shift in terminology and framing, it becomes possible to think more critically about the concept of consumer demand as we consider what services are being provided through the purchase of wildlife or wildlife products. Many of the articles in the literature review did note the different uses for species, for example as medicine, food, ornaments or pets, yet these concepts were not associated with the term value (Hinsley and Roberts, 2015; Nuno et al., 2018; Robinson et al., 2018; Svensson et al., 2016).

Recent work has also begun to tease apart the social motivations for specific usage behaviours and to take a consumer demand perspective (Doughty et al., 2019; Nijman and Nekaris, 2014; Veríssimo et al., 2012). While these studies provide critical insight into trade practices, they often lack the ability to fully explore the complexity and subtlety of differences between consumer purchase intentions, and the motivations and socio-cultural processes that drive individual transactions. It is this knowledge gap that service exchange theory may provide answers for and that we discuss in the following sections.

Axiom 2. Value is co-created by multiple actors, always including the beneficiary [&].

Axiom 4. Value is always uniquely and phenomenologically determined by the beneficiary.

The traditional GD Logic framework views *value* as utility, a particular use that that the product has been designed for by its creator and is then offered to the consumer as value—in-exchange (Prahalad and Ramaswamy, 2004). While at face value this concept of value-in-exchange is intuitive, it cannot fully explain the social complexities involved in trade, particularly when examining the value of religious or cultural symbols. To overcome these limitations, Ranjan and Read (2016) identified three elements that shape value-in-use: *experience*, cognitive and affective processes offering a sense of self-transformation; *relationships*, active participation in exchange creating customer empowerment; *personalisation*, where value is determined by unique, individual characteristics creating infinite value configurations. Similarly, Edvardsson et al. (2011) used social construction theory to develop the concept of value-in-social-context, which encapsulates the impact of social factors on the perception of value and service, and therefore, the value co creation process. The application of social construction theory to wildlife value was discussed from a criminology perspective by Van Uhm (2018), who provides an excellent historical overview of the creation of the attributed values associated with wildlife across a range of societies.

As an example of the inverse of this approach, within ecological policy and practice, economic valuation of ecosystem services is seen as a tool to communicate the importance of biological processes (Laurans et al., 2013). Indeed, the Economics of Ecosystems and Biodiversity (TEEB) initiative, commissioned in 2007 and presented at the 2010 Nagoya meeting of the conference of parties of the CBD, aimed to conduct an economic analysis of the global environment and to implement policies based upon perceived cost-benefit analysis of conservation actions and business development (TEEB, 2010). These market-based approaches have in many ways provided a simple and effective educational tool for policy and intervention. When viewed from the perspective of SD Logic and value-in-social-context, the approach appears an unnecessary oversimplification that risks underestimating or misinterpreting complex socio-cultural meaning.

Similarly, the results of our literature analysis show that trade studies commonly assess value in an economic sense. Many authors include average price per individual sold, average income per year for wildlife sellers or define high-value species as those that have the greatest consumer demand and the greatest sales prices (Gale et al., 2019; 't Sas-Rolfes et al., 2019). While monetary price is a crucial aspect of understanding the mechanisms behind trade, by restricting ourselves to this limited definition we are unable to fully explicate the nature of consumer demand. Monetary price, in this sense, is only reflective of the relative size of the value that the product's service will provide, in other words, it identifies the symptom, not the disease. Furthermore, previous research has shown the discrepancies that can occur when recording retail price due to wholesale prices, exceptional specimens, changes over time and inconsistencies between vendors (Nijman, 2014). Additionally, this is supported by the Nagoya Protocol of the CBD, which acknowledges that "benefits arising from the utilization of genetic resources… may include monetary and non-monetary benefits" (United Nations, 2011). An alternative definition of value, and one which is better suited to the theories proposed in this paper, is 'the relative worth, utility or importance' (Mirriam-Webster, 2019). While price provides a momentary snapshot into the market forces at the point of sale, value can provide insight into both the motivations of the consumers' purchasing behaviour and their desired use for specific wildlife products.

To illustrate these insights, consider the medicinal use of wildlife trade that is so often referenced in both academic literature as well as wider public discourse. Oliviera et al. (2010) categorised the zootherapeutic uses of species found in a medicinal market in Natal City, Brazil. They found that people used species for treating an array of illnesses and ailments ranging from cracked heels or dandruff to haemorrhages, tumours, and wounds in infants. Species used to treat fatal illnesses are likely to have higher value-in-social-context than species used to treat dandruff, however, the perception of specific illnesses is culturally determined and changes over time, therefore it is possible that treatments are perceived differently across communities (Lima, 2007). Additionally, while 17 species were used to treat respiratory illness, only one was suitable for treating the circulatory system. In these instances, the species used for treating circulatory illness is contextually rare and therefore may be more highly valued in the community. Finally, this context illustrates how consumers always determine final value. The medicinal product that treats the condition the consumer is personally suffering will always have the highest value to them – i.e. a species treating a tumour provides no benefit to an asthma sufferer and so on. Unfortunately, we cannot provide confirmation of these values without detailed ethnographic exploration and this must be a focus of future research in this area.

It is therefore critical that demand reduction campaigns are targeted to the specific value assigned to the products by the buyers and multiple campaigns are likely to be required depending on the species, use and

social structures. Many reduction campaigns are based upon moral or legal arguments against purchasing, however, reducing the perception that the species fits its perceived value may create a more effective approach (Moorhouse et al., 2017). Additionally, qualitative analysis on alternative product use is increasing, particularly concerning traditional Chinese medicine (TCM). These studies largely remain focused on identifying the current substitutes available and the individual respondents' self-identified motivations for their choices (Cheung et al., 2018; Theng et al., 2018). Conducting research that focuses on *value-in-social-context* may identify species or products that perform the same services as one another or social groups who each utilise different species or products for the same service (Table 3).

Changing our view towards the '*value-in-social context*' of the species sold in trade as opposed to simply the 'price' enables us to better understand the underpinning motivations of both buyer and seller - which is crucial if we seek to create meaningful behaviour change. (Vargo and Lusch, 2016). This can become extremely complex as species may take on multiple roles at once; for example, one might own a pet as a status symbol, and detailed ethnographic work must be done to disentangle the ultimate motivation for the ownership.

Axiom 3. All social and economic actors are resource integrators.

Axiom three of the SD Logic framework discusses the 'integration of resources' and this refers to the ability of both the consumer and the seller to access the service provided in the exchange by using their own set of skills and competencies (Arnould, 2008). Within services marketing literature there are two types of resources, *operand resources,* those on which an act or operation is performed (eg. raw materials) and *operant resources*, those that act on other resources (eg. knowledge, skills, relationships) (Madhavaram and Hunt, 2008). It is the *operant resources* that have become the primary focus of SD Logic as they represent the skills and competencies that are characteristic of the service-for-service exchange. This exchange of resources can also be characterised as value co-production, which is rooted in knowledge sharing, equity and interaction (Ranjan and Read, 2016).

It is this concept that shifts the nature of exchange away from one of value creation and value consumption and towards a relationship where both parties are active and equal participants. This focus on relationships also acts to reinforce the idea that actors occur in networks and service systems (Vargo and Lusch, 2008). While the exchange itself may be no more than a single transaction, the relationship influences, and is influenced by, the surrounding social structures and the personal experience of both parties (Vargo and Lusch, 2004). The service-dominant view therefore changes from an isolated, dyadic exchange where value is delivered and consumed, to a self-governing system of actors all exchanging and integrating resources with one another.

In their work on the botanical trade of wild-harvested orchids, Masters et al. (2020) reviewed patents for various uses of salep (flour made of the tubers of orchids) and found that although it was predominantly known for its use in medicine, food or beverages there were a great number of applications for the product outside of these fields. Their study additionally provides insight into the changes in value over time as they reviewed a period from 1885 to now and found a marked increase in the number of patents after 1985. While their work was not completed from an SD Logic perspective, it provides as excellent example of how one species can have multiple properties that are valued differently depending on the integration of resources across fields, time and cultures. They determined that different biological properties of Salep were identified in the patents as useful for a wide array of applications including lubrication of oil compositions, the manufacturing of biodegradable materials, the textile industry and dental applications. All of these different uses require the application of different knowledge, skills and physical resources in order for the patent holders to realise the full value of the product to them. As a further example, Vardeman and Runk (2020) found that modern commercial logging of *Dalbergia retusa* (cocobolo rosewood) favours the timber for its aesthetics and durability in furniture, knife handles and more recently guitars. In the 20th century, local production of the timber reduced after it gained a reputation for damaging saw blades due to the density of the wood. By contrast, the indigenous Wounaan people take advantage of its natural resistance to rot to allow them to use fallen logs and roots opportunistically to create carvings and sculptures.

Table 3
Examples of possible services provided by wildlife products and a list of relevant alternatives.

Product	Service	Possible alternative
Wild harvested black orchid *(Coelogyne pandurate)*	Gift for a loved one or respected boss	Expensive jewellery item or other treasured object
	Status symbol	Designer clothing or expensive car
	Complete a collection	Commercially cultivated plant
	Provide aesthetics in the home	Another species of orchid with similar physical characteristics
Sunda slow loris *(Nycticebus coucang)*	As a tourist attraction to provide income	Provide alternate income stream within tourism
	Bones used to ward off evil spirits around the home	Promote the benefits of wild lorises in the immediate area
	As a loved pet	Domestic pet alternative

Axiom 5. Value co-creation is coordinated through actor-generated institutions and institutional arrangements.

Within Axiom 5, institutions are seen to coordinate value co-creation as they allow actors who share institutions to communicate and interact using a common set of habitual actions, symbols and norms, reducing confusion and enabling rapid and widespread service exchange (Vargo and Lusch, 2016). In this context the term institutions does not refer to organisations or firms, but rather to the socially derived conventions that shape human interaction and create social order - coined 'the rules of the game'(North, 1990). In other words, institutions are the recurring patterns of behaviour so prevalent within a society that they become habitual or "normal". Institutionalisation processes are the practices that lead to the broad diffusion and acceptance of ideas so that they become 'institutionalised', and explores the role of socio-cultural, religious, political and legal dimensions in shaping these norms across micro- and macro- levels (Jennings and Hoffman, 2017). They shape the networks within which value co-production takes place, providing a framework through which actors interact with one another and influence the dialogue, willingness to participate and power exchange between actors (Ranjan and Read, 2016). Many of the behaviours that allow trade to take place are governed by institutionalised norms that determine how acceptable actions are within different scales of society. For example, within both the Indonesian online wildlife trade community and the Indonesian conservation community, the same communication styles, honorifics and symbols of respect are required to have successful relationships (Pers. Obs). By comparison, the social norms that guide the trade and use of species within trade are institutionalised only within small subsects of trade communities (Hinsley and Roberts, 2015).

These environments also shape the stability and profitability of trading relationships between online community members. Value creation is a key concept in the field of relationship marketing as ensuring customers perceive their offerings as high value creates customer satisfaction and, in turn, encourages loyalty (Ravald and Grönroos, 1996). Key relationship marketing scholars typically ground their work in service-logic, which differs from service-dominant logic in some key areas, as it provides a more practical basis for managerial decisions. However, Grönroos and Gummerus note that "on an aggregate level in society… SDL and its generic view of value creation and value co-creation provide useful insight that broaden the notion of service (Grönroos and Gummerus, 2014). Thus, exploring actor interactions and relationships within online communities will assist our understanding of

consumer satisfaction, loyalty and willingness to participate in word-of-mouth advertising for wildlife products. This would create a much more accurate picture of the complex dynamics within trade communities and assist conservation practitioners in creating effective strategies to alter consumer behaviours.

As institutional theory is process orientated, it lends itself to the study of *system transformation*, which ultimately occurs due to the creation, diffusion, and dissolution of institutions. This institutional change is critical for system transformation as without it, the behaviours and beliefs that uphold the current power structures will continue to constrain any attempts to create long-lasting and widespread changes (Enquist and Johnson, 2015; Koskela-Huotari et al., 2016). If we seek to create change that is widespread and long lasting, we must seek to alter behaviours on an institutional level, that is, to remove the idea that wildlife trade is to be expected or is just a part of normal life. Institutional studies have been used in the past to explore these processes during widespread social movements such as the Arab Spring and transnational climate policy. These studies emphasised the importance of identifying people who become institutional 'agents', such as activists or commentators, and who take on transformative roles (Schüssler et al., 2014; Skålén et al., 2015). They suggest that in order to disturb the status quo and break institutional beliefs, a sufficiently large number of these agents must create a collective action that disrupts the system (Skålén et al., 2015). A similar approach has been used in conservation for a long time, with former hunters or trade participants often being hired as rangers or forest protectors (Gibson and Marks, 1995). Through this, they act as institutional agents that reject their previously held norms and beliefs.

The concept of system transformation is complicated however by what is referred to as the paradox of embedded agency; how is it that an actor comes to reflect critically on, and even act against, the society and institutions that have shaped their beliefs and behaviours? (Greenwood et al., 2017). Much work has been done to try to resolve this issue in the literature and one suggestion is that agents who occupy less privileged positions, such as the poor, the disenfranchised or the powerless are the ones who will strive for institutional change (Skålén and Edvardsson, 2016). It is interesting, therefore, to consider which local people could be encouraged to take conservation action due to their position within the social structures that enable wildlife trade in each context. Aside from the aforementioned example of forest rangers, institutional agents in wildlife trade could be; (i) indigenous peoples who have conflict or tensions with hunters or loggers who take resources from their land, (ii) people who do not receive economic benefits from hunting but who may gain opportunities from conservation initiatives or (iii) those who have seen a direct negative impact from hunting such as widows whose husbands have been killed due to their participation in hunting.

Institutional theory has a long history of integration and tension with the natural sciences where researchers study the interactions between human societies and the environment (Jennings and Hoffman, 2017). For a number of years, a handful of conservation scientists have been using institutional theory to examine wildlife issues, predominantly in the realm of large-scale land manage for reserves or marine parks (Jacobson and Decker, 2006). Academic interest in the 'drivers of trade' has flourished for much of the last decade (Gao and Clark, 2014; Moorhouse et al., 2017; Nekaris et al., 2010). More recently, through the increase in interdisciplinary work in the fields of criminology and anthropology, there has been a call to include the social, cultural, political and legal contexts in which trade takes place (Bachmann et al., 2019; Van Uhm, 2018; Van Vliet, 2018). However, despite offering rich opportunities to examine the intersection between social networks, economic systems and the physical environment, wildlife trade studies have yet to apply this approach. We propose that these factors are understood best through the lens of institutional theory, as it is able to encapsulate phenomena that are contextual, complex and dynamic, and in which multiple actors interact with one another and their environment.

4. Where to from here?

In this paper, we present a case for using SD Logic as a novel framework through which to view the study of illegal wildlife trade. While we recognise that this is a conceptual paper and may be viewed as abstract, we feel that this shift in rhetoric has real-world implications for conservation practitioners. As transdisciplinary research between the marketing and economic disciplines and the conservation sciences is still in its relative infancy several key research areas will greatly improve our ability to create transformative system change within the field of wildlife trade (Fig. 3).

4.1. Complete small-scale qualitative studies of service exchange and value co-creation

Currently, the study of wildlife trade has yet to evolve their concept of value to value-in-social-context. The reliance on using value-in-exchange (market price) limits our understanding of trade practices to the motivations of suppliers as it cannot provide insight into why the consumer is willing to pay for the products i.e. what they will gain from their ownership. Some scholars have attempted to get around this through research on the drivers of wildlife trade and the description of consumer behaviour. Conservation researchers and practitioners must be careful not to generalise the information presented in these studies due to the highly contextual nature of this work and the differences between social structures across the different countries and the different user groups that occur in the trade network (Phelps et al., 2016). The underlying construct of personalisation as an element of value co-creation further highlights the importance of understanding the myriad ways value can be created and interpreted by actors in any given network (Ranjan and Read, 2016).

Discourse and content analysis of interviews, focus groups and social media content can provide nuanced and descriptive information that sheds light not only on the attitudes and beliefs that local individuals hold towards trade practices but also on how those views change temporally, spatially and socially (Greenwood et al., 2017). This type of behaviour research is particularly suited to online content analysis, with many social groups on Facebook and other internet fora that discuss the trade and ownership of species. Social media data can be collected retrospectively, allowing researchers to collect longitudinal data, and is often linked to geographical location, either through the users' profile information or through the group itself, which can provide highly specific behavioural maps.

The sale of wildlife in online groups also provides a useful illustration of the process of value co-creation, as value propositions and consumer sentiment can clearly be observed as group members interact on the posts. Collecting the comments and responses from the vendor as the sale takes place, may provide data on whether the potential buyers agree with the value proposition or whether the vendor is willing to make the sale to a buyer who is looking for a different service (Siriwat and Nijman, 2018; Siriwat et al., 2019). Additionally, by collecting similar data across multiple posts in the same group, or multiple posts from the same vendor, we can determine any patterns in behaviour that may indicate the institutions which are influencing the attitudes towards the sales. Ideally, conducting a survey or questionnaire of the sellers would also provide insightful data that could identify motivational and institutional factors towards behaviour, however dude to the clandestine nature of the actions it is possible that they would not answer. Ethics should always be considered when conducting qualitative research on cultural or social topics that are sensitive in nature, or which are not fully understood by the authors.

4.2. Examine the processes behind institutionalisation of trade behaviours

One of the key differences between institutional theory and other theories of social behaviour is its focus on processes. Rather than simply

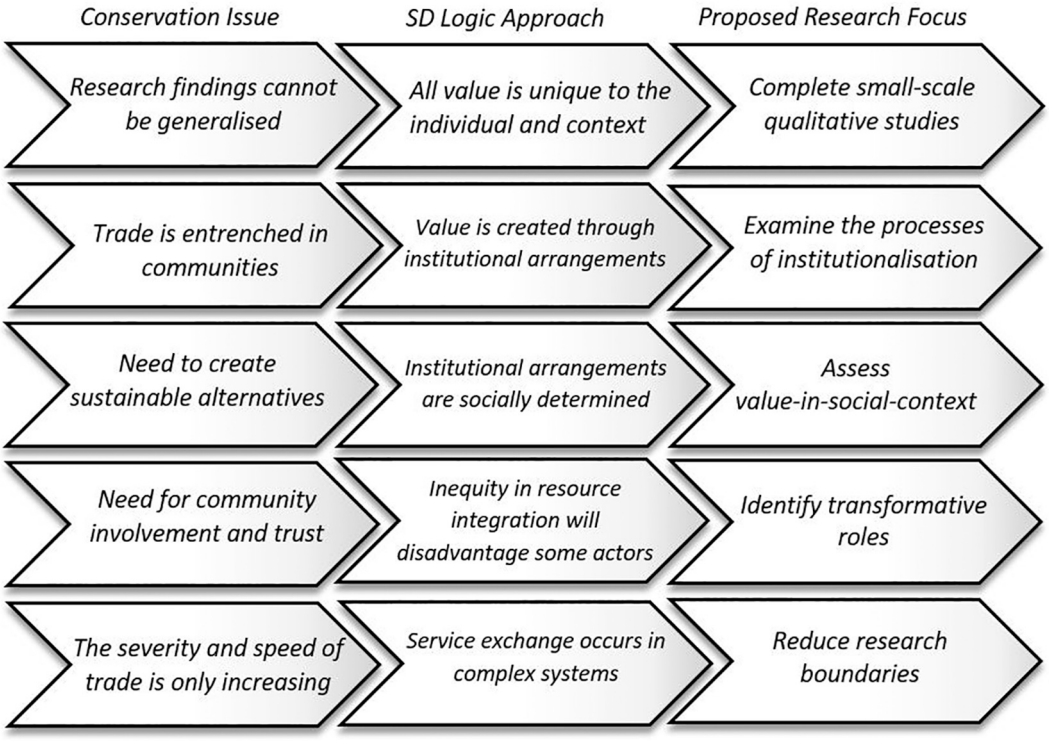

Fig. 3. Examples of how SD Logic can address gaps in conservation literature and practice. We show the potential contribution of SD Logic to studies of wildlife trade and species conservation.

describing the current social factors that influence trade, this change towards studying the processes by which those factors became widespread, would provide critical insight into how transformational change may occur in the future. Conducting historical studies of the institutionalisation of beliefs and attitudes towards trade may offer opportunities to identify the key stakeholders that led to the adoption of trade practices and allow conservation practitioners to consider the current roles of those in power and the part they may have to play the reduction in trade behaviours. Future research may also examine how the elements of equity, knowledge-sharing and interaction combine to alter value co-production over time (Ranjan and Read, 2016).

This type of longitudinal work can be conducted using empirical studies that use evolutionary game theory and learning models to assess how traits such as habits or preferences emerge, or with analysis of how social structures, organisations and agency constrain this emergence (Greif, 1998). This would require either the collection of secondary data on perceptions through social media, newspapers, blogs and books or the collection of detailed interviews in which the participants feel open to discussing their understanding of their own beliefs and those of others around them. Consider a study in which the use of a particular traditional Chinese medicinal product was examined using recipes, diaries or books from the 17th century until now compared with news articles, social media posts and/or interviews with pharmacy workers and TCM practitioners. This volume of data, while daunting, would provide a sound basis from which to explore the creation of the foundational beliefs that have led to the institutional use of this product and may hold the key to explaining how to create institutional change once more.

4.3. Assess value-in-social-context in all demand-reduction strategies

Small scale qualitative studies, interviews and assessments should be undertaken to ensure that consumer behaviour is fully understood prior to the implementation of demand reduction campaigns. These studies can then be used as baselines to measurably assess institutional change over time as a result of demand reduction strategies. Without institutional change, a true system transformation will not occur, and behaviour changes will be fragile without the continued input of conservation organisations and education providers (Anderson et al., 2013). Demand reduction strategies remain under-studied and under-funded, however, two common interventions are the offering of substitute products and the provision of education around the efficacy of products for their intended use (Thomas-Walters et al., 2020; Veríssimo and Wan, 2019). In order to create effective alternatives, the substitute must provide the identical service to the actor but in a sustainable way that no longer endangers populations. Similarly, in order to make the argument that the product does not fit the intended use, one must first truly understand the service that the product is providing. By unravelling the processes behind social meanings behind the value consumers and sellers co-create within the purchase, ownership and trade of wildlife, practitioners can best allocate financial and physical resources when offering substitutes or education campaigns.

4.4. Identify transformative roles within wildlife trade

System transformation relies on actors who are willing to act to break and reshape institutions by taking on transformative roles (Skålén and Edvardsson, 2016). These actors must have agency, the ability to be self-reflective on their participation in the institutions of wildlife trade and the resources to act against those institutions. These transformative actors are typically those who are not receiving the social, economic or political benefit of the institutions and are often marginalised or underprivileged. Research to identify transformative roles in trade communities and the motivations of actors to take up these roles would enable conservation practitioners to encourage and equip those actors with the resources they need to create effective and enduring institutional change. Researchers and conservation practitioners conducting in-situ work are best placed to identify these actors, however, they should always be informed by individuals fully aware of and immersed within the social and cultural norms of their participants.

4.5. Reduce research boundaries

Wildlife trade research has done an excellent job at working across both micro- and macro- levels, with studies ranging from the impact of local populations of single species, to the impact of entire sections of trade, such as the global live pet trade (Bush et al., 2014). Many studies remain restricted to high profile taxa and/or expertise on particular taxonomic groups, countries or specialties. While we wish to emphasise the unique and contextual nature of trade, the SD Logic approach in many ways reduces the need for these divisions.

Future consumer behaviour research should examine the underlying social frameworks that result in product preferences emerging in their relevant societies and the ability for actors to assess their options and choose alternatives where possible. This will no doubt require the sharing of resources and knowledge of authors from different specialities to ensure that data is collected accurately and sensitively, that taxonomic identification of specimens is correct and that the institutions of the society are comprehensively understood. While this may seem a daunting task, complex and multi-specialist research has been completed before many times in the wildlife trade field and the scale, severity and speed of the threat of trade requires academics and practitioners to consider all available techniques (Buhlmann et al., 2009; Esmail et al., 2020).

Contributions

Our work contributes to scientific discourse by presenting SD logic as a novel lens through which to explore consumer behaviour in the context of illegal wildlife trade. It extends our understanding of ecosystem services by adopting a service marketing approach and reframing the consumption of biological resources and the value-in-social-context of biodiversity. We hope that the new insights gleaned through this unique approach will support conservation scholars and practitioners through actionable strategies to bring sustained behaviour change. As wildlife trade researchers work at the intersection of human society and wildlife, it is crucial that trans-disciplinary work continues across the natural and social sciences (Reed, 2008). There is much to be learned from relevant academic fields including evolutionary biology, ecology, criminology, political science, marketing, economics, psychology and anthropology and future research must continue to collaborate and bridge the gap between these fields. Additionally, it is vital that not only do we continue to assess novel approaches and techniques but that we ensure that published work is easily accessible. Any knowledge we acquire must be able to be successfully integrated into the resources of conservation practitioners and researchers in order for it to reach its full and final value.

CRediT authorship contribution statement

Kim Feddema - Conceptualization; Data curation; Formal analysis, Investigation, Writing - original draft, Visualization.

KAI Nekaris – Supervision; Writing - Review & Editing.

Vincent Nijman - Supervision; Writing - Review & Editing.

Paul Harrigan - Project administration; Supervision; Writing - Review & Editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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