Journal of Economic Psychology 32 (2011) 418–424

Contents lists available at ScienceDirect

Journal of Economic Psychology

journal homepage: www.elsevier.com/locate/joep

Keeping up with the Joneses: Dolphins' search knowledge for knowledge's sake

Yaniv Shani [a,*,1], Marie Christine Cepicka [b,1], Nadav Shashar [b,c,*,1]

[a] Recanati Graduate School of Business, Tel Aviv University, Israel
[b] International Laboratory for Dolphin Research, Dolphin Reef, Eilat, Israel
[c] Department of Life Sciences, Eilat Campus, Ben-Gurion University of the Negev, Israel

ARTICLE INFO

Article history:
Received 24 September 2010
Received in revised form 31 December 2010
Accepted 23 February 2011
Available online 1 March 2011

JEL classification:
Z19

PsycINFO classification:
2420
2440

Keywords:
Curiosity
Information search
Dolphins
Uncertainty

ABSTRACT

Recent research on decision-making established that when not knowing the possible negative outcome of past experiences, individuals search for more information even when it confirms their early negative suspicion. It is argued that what drives this information search is the hope that the unpleasant state of "not knowing" ends when one faces the truth (Shani, Igou, & Zeelenberg, 2009; Shani, Tykocinski, & Zeelenberg, 2008; Shani & Zeelenberg, 2007). In this manuscript, we show that bottlenose dolphins as well, sometimes seek to increase their knowledge concerning food allocated to other dolphins in the group, even though such knowledge could not increase self-food availability. This search increases when own feed is augmented, and decreases when sexually engaged (a competing basic need to food and curiosity), suggesting that knowledge for knowledge's sake emerges particularly when the organisms' basic needs (e.g., food) have been satisfied, allowing higher-level psychological needs to emerge. This finding has diverse implications for understanding humans' curiosity and social comparison tendencies, as it appears that even in the animal kingdom information is viewed as a valuable asset of itself.

1. Introduction

Motivations behind animals' actions are typically explained as utilitarian, providing tangible benefits for the animal (Blaisdell, Sawa, Leising, & Waldmann, 2006; Clayton & Dickinson, 2006; Skinner, 1938). Regardless of the risk involved in exploratory behavior, animals' curiosity can be interpreted as a functional trait in light of its capacity to improve on future actions and survival chances (Berlyne, 1954a, 1954b, 1955, 1966). What is usually interpreted as a demonstration of *Non-Instrumental Curiosity* (i.e., knowledge for knowledge's sake) is normally limited to describing the behavior of humans, who are usually considered to have strong cognitive and social proclivities (Bastardi & Shafir, 1998; Litman, Hutchins, & Russon, 2005; Loewenstein, 1994).

Despite the intuitively appealing resonance of exploratory curiosity, communicating high-level cognitive needs either for mammals (Sacket, 1972; Schusterman, Thomas, & Wood, 1986) or humans, a byproduct of such curiosity is often manifested in individuals' tendencies to expose themselves to unpleasant information, even when such information is of no use to their

* Corresponding authors. Addresses: Recanati Graduate School of Business, Tel-Aviv University, Ramat Aviv, Israel. Tel.: +972 543029194 (Y. Shani); International Laboratory for Dolphin Research, Dolphin Reef, Eilat, Israel. Tel.: +972 545494166 (N. Shashar).
E-mail addresses: shanivya@tau.ac.il (Y. Shani), nadavsh@bgu.ac.il (N. Shashar).
[1] All authors contributed equally to the study.

0167-4870/$ - see front matter © 2011 Elsevier B.V. All rights reserved.
doi:10.1016/j.joep.2011.02.014

achieving future goals. This search for allegedly non-instrumental and possibly negative information is evident in the conundrum of human dilemmas, demonstrated in many humans' decision problems. For instance, following a raise in one's salary, one may be curious to learn the size of a fellow employee's raise, particularly when suspecting that the latter's is higher. Similarly, customers may compare prices of products they long ago purchased if they believe that they were ripped off, or when suspecting having bypassed an opportunity for a discount (Loewenstein, 2006; Shani et al., 2009) or an opportunity to win the lottery (Shani & Zeelenberg, 2007; Shani et al., 2008). It has been suggested that humans' willingness to expose themselves to potentially unpleasant information often serves as a strategy for regulating the intense negative feelings and ruminations associated with concern that this information is indeed unpleasant, i.e., their suspicions are warranted. Nevertheless, for animals to seek ostensibly non-instrumental information simply due to curiosity would appear at least somewhat superfluous, as it carries additional costs in energy, time, and incremental risks (Berlyne, 1966).

The challenge associated with the search for information that does not offer clear benefits to the searching organism, has intrigued scientists for many years. As a reference point, Mayr (1961), for example, postulated that all "why" questions related to organism behavior should be evaluated in an evolutionary prospectus. Similarly, Tinbergen (1963), discussing four points of view (proximate, ultimate, developmental, and evolutionary) to evaluate behavior, suggested that the separation between proximate and ultimate benefits is interesting and not trivial (in Curio (1994)). In search for future rewards for exploratory behavior, Tolman (1948) proposed that exploration activities might enable the animal to generate a map of the environment, which could be useful at a later stage (see also discussion in Dyer (1998)). In the same line of reasoning, McFarland (1993) proposed that gathering information that has no immediate use might be beneficial in a changing environment. Such reasoning takes into account that potential benefits from the ostensibly Non-Instrumental Curiosity may be realized only probabilistically, later in the animal's life (Schuster & Perelberg, 2004) or evolutionary, later on a time scale (Mayr, 1961).

Utilizing an opportunity to study and measure presumably Non-Instrumental Curiosity in a group of eight bottlenose dolphins (*Tursiops truncatus*), we documented an observation of ostensibly superfluous curiosity in dolphin behavior concerning the quantity of food allocated to *other* dolphins, even though this behavior does not yield an increase in *self*-food availability. We suggest that the ostensibly superfluous information search may actually be beneficial to the animal by alleviating anxiety and reducing uncertainty when learning more about the type and amount of food other dolphins enjoy. Furthermore, we suggest that this "Non-Instrumental Curiosity" becomes particularly relevant when the organism' basic survival needs have been met, consequently allowing the higher-level, psychological needs in the hierarchy to emerge (Maslow, 1943).

Following this, just as employees who suspect that their own increase in salary might imply that a fellow employee enjoyed a better raise, and thus, might verify that this was not the case, we suggest that uncertainty about the type and quantity of food with which other dolphins were provided, increases with dolphins' self-food intake, as it implies the possibility that other dolphins might enjoy an augmented food intake as well. Thus an increase in dolphins' self-food intake may enhance counterintuitive and self-deprived[2] curiosity (Loewenstein, 1994), manifested in social comparison tendencies, aimed to alleviate the unpleasant suspicions and restore the organism's homeostasis, which is necessary to maintaining healthy functioning (Berlyne, 1955).

We interpret this ostensibly counterintuitive curiosity shown in dolphin behavior as an indication of the existence of a fundamental need to regulate concerns associated with uncertainty (i.e., suspecting other dolphins in the groups of augmented food intake). This need to "learn" more about other dolphins' food intake was expected to occur particularly when the dolphins' basic survival needs were satisfied (i.e., dolphins obtain more than the required quantity of food to survive); and to decline with the existence of a competing basic need (Maslow, 1943), in this case sexual interaction. This need would add to previous literature, inferring humans' non-direct learning capabilities, demonstrating how organisms (e.g., rats) still learn (i.e., benefit) by utilizing cognitive schemas developed during a failed attempt to enjoy direct reinforcement (e.g., food) (Tolman, 1948); or are still willing to cooperate even in the absence of immediate payoff (Schuster & Perelberg, 2004). Specifically, the phenomenon we introduce reflects organisms' well-known primary sensitivity to loss (Chen, Lakshminarayanan, & Santos, 2006), a phenomenon that up until now has mainly been demonstrated in human behavior (Kahneman & Tversky, 1979; Stapel & Blanton, 2006; Stapel, Koomen, & Velthuijsen, 1998). Thus, the ostensibly Non-Instrumental Curiosity phenomenon we describe, observed, and measured in the unique research settings the sea enclosure provides, sheds more light on one of the most genuine facets of human and animal curiosity.

2. Methods

A group (pod) of eight bottlenose dolphins (*Tursiops truncatus*) residing at the Dolphin Reef, a spacious commercial sea enclosure located in Eilat-Israel, are fed individually five times a day. To minimize aggression, feed is dispensed to each dolphin from one of three rafts. Feeding locations and trainers allocating food were changed randomly during the period of the study. Thus, every couple of days, trainers were randomly assigned a new raft (feeding location) and different dolphins were assigned to them. All feedings are simultaneous, and trainers take great pains to ensure that feedings begin and end at the exact same moment. Dolphins are fed *only* at their designated rafts (to which they are summoned by a specific sound signal). Three of the dolphins have been exposed to this feeding style from birth, and the other five during the seven years prior to

[2] As distinct from intellectual curiosity aimed to increase individuals' knowledge, communicating a desire to increase knowledge, the theoretical part and our definition of curiosity is based on Information Gap Theory (Loewenstein, 1994), which interprets curiosity as a form of cognitively induced deprivation that arises from the perception of gaps in knowledge.