List of Dissertation Abstract　(Dissertation Doctor)

Name	Supervisor	Title	Abstract
Nehls Paul Notebaart	Fujii Tomohiro	SECOND LANGUAGE ACQUISITION OF ENGLISH QUANTIFIER *MOST* BY JAPANESE LEARNERS	The goal of this dissertation is to argue that studying the English quantifier most in an experiment setting uncovers new insights into the language acquisition of quantifiers. First, three experiments using most were conducted to determine the veracity of two separate approaches used to explain Scalar Implicature (SI) generation, namely, whether they arise as default inferences, or rather result from a pragmatic calculation based on context. Japanese second language learners of English were compared to first language English and Japanese speakers using the Truth Value Judgement Task (TVJT). The results of this study showed Japanese learners treated quantifiers some and most differently. This suggests a third approach is necessary, one that sees implicatures as a part of the lexical content attached to each individual quantifier, but which do not arise by default. Second, another set of experiments were conducted to address a potential learning problem associated with the semantics of most. After identifying a linguistic difference between most and the Japanese quantifier hotondo ‘most’ the goal became to find if the semantic difference between the two would constitute a learning problem for Japanese learners of English. The identified difference between the two is English most is considered “more than half,” while hotondo is “nearly all.” This semantic difference is not explicitly taught in classrooms, so acquisition by learners would need to take place through experiencing most in contexts where they might receive contextual clues. This study also used TVJT, and results indicate that lower proficiency learners do treat English most more like Japanese hotondo. In summary, creating a new approach to explain SI generation and identifying a learning problem accomplishes two things. It advances insights into quantifier acquisition generally as well as raises understanding of acquisition of the semantics of most by Japanese learners.

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Mahoro Tomitaka	Takehiro Sasaki	Public aesthetic and conservation preferences for nature across scales: from wildflowers to landscapes	Biodiversity loss is a global challenge, and the success of its conservation depends greatly on society's decision-making. Among the various factors involved, aesthetic preferences are one of the important drivers that can implicitly influence conservation awareness, and they form the foundation of cultural ecosystem services. This study aimed to clarify people's aesthetic and conservation preferences, as well as the factors that shape those preferences. At the species scale, while certain traits—such as blue flowers—are widely preferred across many people, individuals with richer botanical knowledge tended to prefer species with more complex traits, as well as rare or native species. At the community scale, flower assemblages with greater color diversity and higher species richness were found to be more broadly favored. At the landscape scale, preferences were shown to differ depending on ecosystem type and management conditions. Moreover, individuals with richer nature experiences, ecological knowledge, or higher frequencies of visiting green spaces exhibited stronger willingness to pay for conservation. These findings suggest that people's experiences with nature and their interest in the natural world shape their preferences and can enhance their motivation for conservation. Utilizing universally appealing species or landscape elements as conservation flagships—while also accounting for diverse preferences and designing spatial plans tailored to the characteristics of each ecosystem—may be effective for achieving both biodiversity conservation and the provision of cultural ecosystem services.

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Kenichi Hakozaki	Shibutani Tadahiro	Stady of SF cask behavior under the drop test based on the acceleration data	Understanding the behavior of the spent fuel casks under 9m drop tests is important for assessing safe transport of the spent fuels. In this study a new analysis method for acceleration data measured in drop tests (AIVA method) is presented. It is confirmed that the results obtained by AIVA method are consistent with those obtained by the conventional method (low-pass filter), and regarding the acceleration data measured in the drop test AIVA method is more useful than the conventional method. Based on AIVA method several new knowledge regarding the cask behavior under drop tests could be discovered.
Yasuhiro Kawabata	Fudeyasu Hironori	Evaluation of Uncertainty in Tropical Cyclone Genesis and Track Forecasts with Ensemble Prediction	Tropical cyclones can cause severe disasters such as strong winds, heavy rainfall, and storm surges, and reducing these risks requires improved understanding and advancement of tropical cyclone forecasting. In this study, we quantitatively clarified the characteristics of uncertainties in tropical cyclone genesis and track forecasts using ensemble prediction. Verification of genesis forecasts revealed differences in forecast probabilities among multiple numerical weather prediction centers. For track forecasts, we found that the probability ellipse representation, which expresses the predicted area as an ellipse, captures the spread of ensemble forecasts more appropriately than the probability circle. Furthermore, long-term statistical analyses of tropical cyclone activity showed a westward shift in the genesis locations of strong tropical cyclones. These findings suggest that tropical cyclone genesis and tracks are influenced by atmospheric and oceanic environmental conditions. The results of this study provide valuable insights that enhance the understanding of uncertainties in tropical cyclone forecasting and support the effective use of forecast information, contributing to disaster prevention.

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NAKAMURA Hitoshi	Shibutani Tadahiro	Limit conditions for local failure in steel components (local stress criterion for ductile fracture and its integration into damage mechanics)	This study clarifies the limiting conditions of local failure (ultimate ductile fracture) in steel components and establishes an evaluation methodology. Tensile tests of notched specimens and thich-plate specimens enabled classification of local failure into three modes—tensile, shear, and crack-initiation—and the formulation of corresponding local stress–strain criteria. A damage mechanics model incorporating the experimentally determined critical failure stress index was developed, accurately predicting ductile crack growth. The proposed approach demonstrates applicability to fracture mechanics and offers a new framework for assessing the ultimate strength of steel structures
Osawa Yukiko	Hiratsuka Kazuyuki	Studies on isomerization Technology and Industrial Application of Astaxanthin from *Paracoccus carotinifaciens*	Astaxanthin is a red carotenoid widely distributed in marine organisms and is extensively utilized in aquaculture and food industries. In recent years, natural astaxanthin derived from microorganisms such as *Paracoccus carotinifaciens* has attracted increasing attention as an alternative to synthetic sources. However, carotenoids generally exhibit low bioavailability due to their high hydrophobicity and crystallinity. Recent studies have suggested that cis-isomers of carotenoids may exhibit higher solubility and bioavailability than the all-trans form, although investigations focusing on naturally derived astaxanthin remain limited. Therefore, this study aimed to develop industrially applicable cis-isomerization techniques for astaxanthin derived from *P. carotinifaciens* and to elucidate its in vivo behavior and potential applications. First, efficient conditions for cis-isomerization of natural astaxanthin were investigated using microwave treatment and supercritical CO_2 extraction processes. Next, animal experiments using rats demonstrated that cis-astaxanthin showed higher plasma concentrations and tissue accumulation than the all-trans form. Furthermore, feeding trials with rainbow trout and laying hens revealed that cis-astaxanthin improved muscle pigmentation in fish and egg yolk coloration in hens, accompanied by enhanced in vivo accumulation efficiency. These results demonstrate that the control of astaxanthin isomer composition can improve the bioavailability of naturally derived astaxanthin and highlight its potential for expanded applications in food and feed industries.

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Yasuhiro Noya	Taizo Nakamori	Predicting Changes in Gravel Bar Area Using Time-Series Analysis of Annual Maximum Water Levels: Implications for Gravel-Habitat Specific Plants	Extensive gravel bars in the middle reaches of rivers provide critical habitats for riverine endemic plants that occur exclusively on these bars. However, these habitats have been declining in recent decades. Floods play a dual role: they create new gravel bars, yet simultaneously reduce plant populations by washing away or burying them. This study aims to predict temporal changes in gravel bar area using annual maximum water levels from the 1950s to the 2020s. Missing water level data were reconstructed from observations at nearby stations. We developed a model in which gravel bars formed by floods decrease exponentially through vegetation succession but are replenished by subsequent floods. Reconstruction of past dynamics revealed that newly formed gravel bars almost completely disappear within three years due to succession. Furthermore, the three-year moving minimum of gravel bar area—an indicator of habitat availability over a generation time—has declined, while the five-year moving coefficient of variation—an indicator of habitat instability—has increased. Both trends suggest increasingly unfavorable conditions for riverine endemic plants. Keywords: gravel bar, riverine endemic plants, annual maximum water level, vegetation succession, habitat dynamics