The roles of predictive information in absolute evaluative processing

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出版情報：Kyushu University, 2018, 博士（システム生命科学）, 課程博士
バージョン：
権利関係：

（様式６－２）

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論　文　名	The roles of predictive information in absolute evaluative processing（絶対評価のプロセシングにおける予測情報の位置付け）
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論　文　審　査　の　結　果　の　要　旨

This research uses behavioral analysis and eye-tracking with humans to examine the role of prediction in absolute evaluative decision-making, when people can express a subjective rating. Previous research had studied evaluative decision-making mostly in relative evaluation conditions, when subjects are required to choose their preferred item from two or more options. Moreover, previous research typically used only positive items as stimuli. As a consequence, predictive information (in the form of predictive cues) had been seen to influence the choice, without being able to establish whether the predictive cues actually had an impact on the evaluative processing. Moreover, the previous literature implied contradictory hypotheses on the role of prediction in evaluative processing. On the one hand, the influence of predictive cues on choice suggested that predictions should lead to spillover effects (positive predictions lead to more positive evaluations, negative predictions lead to more negative evaluations). On the other hand, the well-known phenomenon dopamine prediction error suggested the opposite hypothesis, implying that surprise should lead to a boost of dopamine, and therefore a boost of affective value, leading to higher evaluations.

To disambiguate these possibilities, a novel paradigm was devised, with a bivalent stimulus set of food images, including appetitive and aversive items, while subjects were asked to give ratings for each image separately. In this way, it was possible to create prediction error situations, and to examine the role of prediction on evaluative processing itself, regardless of any influence in behavioral choice.

In two sets of experiments, it was found that predictive cues influenced the ratings of the food images by eliciting an active confirmation bias, in line with the hypothesis of spillover. At the same time, the pattern of reaction times indicated a clear prediction error effect, such that ratings were given faster when the valency of the food item matched with the prediction. Thus, it appears that any putative dopamine activity related to prediction error had no impact on the evaluative processing.

The data provided new insights into the mechanisms of evaluative decision-making, emphasizing the importance of distinguishing between absolute and relative evaluative

decision-making. Furthermore, the combination of spillover effects in the ratings with updating effects (depending on prediction error) in the reaction times raised important new questions about the underlying neural mechanisms. Particularly, based on the present research, it can be hypothesized that, contrary to common conceptions in the literature, dopamine prediction error does not impact strongly on concurrent affective valuation. Thus, the present research establishes a crucial contribution to our understanding of evaluative decision-making.

Therefore, we conclude that this thesis deserves to be acknowledged as a doctor's thesis (Systems Life Sciences).