Preschoolers' Neophobia Influences Category-based Abilities Beyond the Food Domain

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Abstract

Food neophobia – the reluctance to eat novel food – has been associated with poorer performance in category-based tasks within the food domain among preschoolers. This research aims to unravel this negative relationship and determine if this association is specific to food items or reflects general cognitive rigidity in considering alternative ways to represent entities. In study 1, 123 children between 3 and 6 years were tested on an inductive reasoning task, comparing food and animals. In study 2, 112 children aged 4 to 6 engaged in a cross-categorization task comparing food, animals and artifacts. Results indicated that neophobic children exhibited poorer induction and cross-categorization performance in all domains compared to their neophilic counterparts. These findings highlight the importance of child characteristics in shaping the general development of category-based abilities and suggest that food neophobia, rather than a fear of novelty, reflects instead difficulties in changing perspectives once items have been classified.

Keywords: food neophobia; category-based abilities; inductive reasoning; cross-categorization; individual differences; children

Introduction

Entities can be cross-categorized into different categories. For example, a chair can be perceived as an "office chair", a "piece of furniture", an "artifact", a "place to sit and rest", or even an "antique collectible" or an "art object". Cross-categorization allows individuals to infer the most relevant information based on the category ascribed in a given context. For example, designating a chair as an "office chair" enables us to induce its purpose for work, designed for comfortable prolonged sitting. Conversely, categorizing the same chair as an "antique collectible" suggests a high value, discouraging its use for sitting.

The development of category-based abilities such as cross-categorization or inductive reasoning (i.e., inferring the properties of an entity from the knowledge of its category; Feeney & Heit, 2007; Murphy, 2002) have been investigated in various domains (e.g., food, animals, artifacts; Gelman, 1988; Gelman & Markman, 1986; Nguyen & Murphy, 2003). Extensive research indicates that children, from the age of three, exhibit growing cross-categorization (Blaye & Jacques, 2009; Nguyen, 2007; Nguyen & Murphy, 2003) and inductive reasoning abilities (Gelman & Coley, 1990; Gelman & Markman, 1987).

While category-based abilities development is typically studied in relation to age, individual differences among children are often overlooked, except in cases of cognitive impairment or intellectual deficiencies (Comblain et al., 2023). However, recent studies highlight a specific child characteristic that can impede category-based abilities' development: food neophobia, reflecting how children approach novel foods (Lafraire et al., 2016).

For instance, studies by Rioux and collaborators (2016; 2018a; 2018b; see also Foinant et al., 2021, 2022a), have established a negative association between food taxonomic category-based abilities and food neophobia in preschool-aged children. Children aged 2 to 6 years had to classify foods as either fruits or vegetables (Rioux et al., 2016). The main result was a significant negative correlation between children's food neophobia scores and categorization performance. In a subsequent study (Rioux et al., 2018a), showed that children with higher levels of food neophobia relied more on perceptual similarities, specifically color, in an inductive reasoning task in which they had to infer novel properties of foods. For instance, highly neophobic children would generalize a blank property such as '*contains zuline'* from a green zucchini to a green banana, whereas neophilic children generalized it taxonomically and not perceptually, to an orange carrot.

The negative relationship between food neophobia and category-based abilities also extends to thematic categories (Pickard et al., 2021, 2023). Using a proportional analogy task (A is to B what C is to *"D"*), Pickard et al. (2021) observed that when presented with a thematic food base pair (A:B; e.g., ice cream:wafer cone) neophobic children failed more often to correctly extend this relation to the thematic match of the target C (C:?; burger:burger bun or chicken) than their neophilic counterparts. Pickard and colleagues

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(2023) expanded their investigation to assess whether food neophobia would negatively predict children's capacity to cross-categorize food items based on thematic (i.e., spatial and temporal contingencies) and meal script classifications (e.g., diner). Children aged 3 to 6 were tasked with sequentially categorizing a target food (e.g., fish) with one thematically related item (i.e., a lemon) and a second item related to meal scripts (i.e., lasagna), while disregarding an unrelated distractor (i.e., chocolate). Results revealed a negative correlation between children's food neophobia scores and their proficiency in cross-categorizing the target item according to the two different classifications.

These findings strongly support a negative association between food neophobia and category-based abilities in the food domain, encompassing various categories (e.g., taxonomic and thematic) and skills (e.g., induction and cross-categorization). However, the aforementioned evidence primarily addressed the influence of children's food neophobia on category-based abilities using food items. This approach overlooked an exploration of whether this association also generalizes to other domains. Our research seeks to explore whether the negative influence of food neophobia on category-based abilities is specific to the food domain or extend to other domains, such as animals and artifacts. If neophobic children's difficulties extend to other domains, it would suggest that food neophobia is grounded in general psychological mechanisms rather than being connected to specific associations with food concepts.

A recent study by Rioux et al. (2018b) implies that the association between food neophobia and category-based abilities may extend beyond the food domain, being, instead, rooted in perceived novelty (Rioux et al., 2018b). The authors tested 109 children aged 3 to 5, demonstrating that neophobic children exhibit poorer taxonomic inductive reasoning in both the food and artifact domains compared to their neophilic counterparts. The study involved presenting triads with an unfamiliar target (either a food or artifact, e.g., water rose apple) and two equally unfamiliar choices: a taxonomically related option (another food or artifact, e.g., a pitaya) or a perceptually related option (e.g., a mineral with the same shape or color as the target, e.g., crocoite). Food neophobia negatively correlated with children's ability to generalize the target's property to taxonomic matches in both food and artifact triads, suggesting that the association between food neophobia and category-based abilities extends beyond the food domain. The authors attributed these results to food neophobia representing a specific manifestation of a broader, domain-general predisposition to fear novelty (Moding & Stifter, 2016).

While applicable to tasks with novel, unfamiliar items, this explanation does not fully address the observed negative impact of food neophobia on children's category-based abilities with familiar items (e.g., see above Pickard et al., 2023 and Rioux et al., 2018a). Two distinct hypotheses could potentially reconcile results across both familiar and unfamiliar items.

The first hypothesis posits that neophobic children may lack familiarity with food, potentially due to their tendencies limiting exposure to various food types, thus reducing opportunities for developing food-related knowledge (Rioux et al., 2016). For instance, in Rioux et al.'s (2018a) inductive reasoning task with familiar food items, neophobic children might have more frequently generalized the target's property to the perceptual match than the taxonomic match due to a lack of knowledge about how the taxonomic match related to the target (e.g., not recognizing both zucchini and carrot as vegetables). Essentially, this hypothesis assumes that the impact of food neophobia on category-based abilities is triggered by the perceived novelty of items, either genuinely novel (as in Rioux et al., 2018b) or less familiar for neophobic children than neophilic children (as interpretated in Rioux et al., 2018a).

The second hypothesis suggests, instead, that food neophobia negatively affects category-based abilities due to cognitive rigidity in considering alternative ways to mentally represent entities (Foinant et al., 2022b). Foinant and colleagues (2022b) recently demonstrated a negative correlation between preschoolers' food neophobia and executive functions, in particular cognitive flexibility. These findings invite to reinterpret previous research on the link between food neophobia and category-based abilities. Neophobic children may not fail to infer the target's property to the taxonomic match (Rioux et al., 2018a, 2018b) due to a lack of knowledge about their relationship. Instead, the challenge may stem from an inability to consider alternatives to the default, appearance-based classification. This suggests that neophobic children face difficulties inhibiting a salient, albeit inappropriate, classification in favor of a less salient but more appropriate taxonomic classification. A similar interpretation can be drawn for Pickard et al.'s (2023) cross-categorization task. Neophobic children may struggle to successively categorize a target item according to two different classifications, not from a lack of knowledge about the alternative classification but rather from their struggle to represent the item from a different perspective once it has been categorized according to one classification.

If food neophobia's influence on category-based abilities is tied to cognitive rigidity rather than the perceived novelty of items, it should be evident even with familiar items across various domains. Conversely, if the association between food neophobia and category-based abilities is tied to perceived novelty, we anticipate lower performance in neophobic children for food items that are considered familiar to young children, but not necessarily for familiar items from other domains when compared to their neophilic peers. To investigate this, we conducted two studies involving children aged 3 to 6. The first study assessed inductive reasoning in the food and animal domains through a property generalization task, where perceptual similarity and taxonomy were pitted against each other (Gelman & Markman, 1986). The second task, inspired by Pickard et al. (2023, study 3) and Blaye and Jacques (2009), was a cross-categorization task with items from the food, animal and

artifact domains. In this task, children sequentially associated a target item (e.g., sausages) with a taxonomic choice (a chicken leg) and a thematic choice (hot-dog buns), presented simultaneously with an unrelated choice (cherries).

Method study 1

Participants

No prior research has specifically examined the impact of food neophobia scores on children's inductive reasoning performance across two domains with familiar items using a mixed linear modeling approach. Power analysis estimates have been determined based on the work of Rioux et al. (2018a). The authors obtained a significant correlation effect between food neophobia scores and performance with an effect size of r = -.33. To achieve a comparable effect size, a sample size of 92 children would be required to attain a power of 0.9 at an alpha level of 0.05.

Participants were 123 children (67 girls; age range = 3.34 to 6.29 years; mean age = 5.10 years; *SD* = 0.67). They were predominantly Caucasian and came from middle-class urban areas. Informed consent was obtained from their school and their parents. The procedure was in accordance with the Declaration of Helsinki and followed institutional ethics board guidelines for research on humans.

Materials and procedure

To assess each child's level of food neophobia, caregivers filled out the Child Food Rejection Scale (CFRS; Rioux et al., 2017). The CFRS is a hetero-evaluation scale measuring 2-to-7-year-old children's food neophobia on a 6-item scale. On a 5 levels scale (Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree), caregivers were asked to rate the extent to which they agree with statements regarding their child's neophobia (e.g. "My child rejects a novel food before even tasting it"). Higher scores indicate higher levels of food neophobia (scores could range from 6 to 30, mean = 16.2, *SD* = 5.11).

The inductive reasoning task The materials consisted of 16 triad sets with color photographs, divided into 8 food triads and 8 animal triads. Each triad was presented on a laminated A4 sheet displayed horizontally, with the target at the top and centered, and two test items on the same line below the target (see Figure 1*a*). *Test item 1* belonged to the same taxonomic basic category as the target, but was perceptually dissimilar, and *test item 2* belonged to a different taxonomic superordinate category from the target, but was perceptually similar to the target. The spatial location of *test item 1* and *2* was counterbalanced.

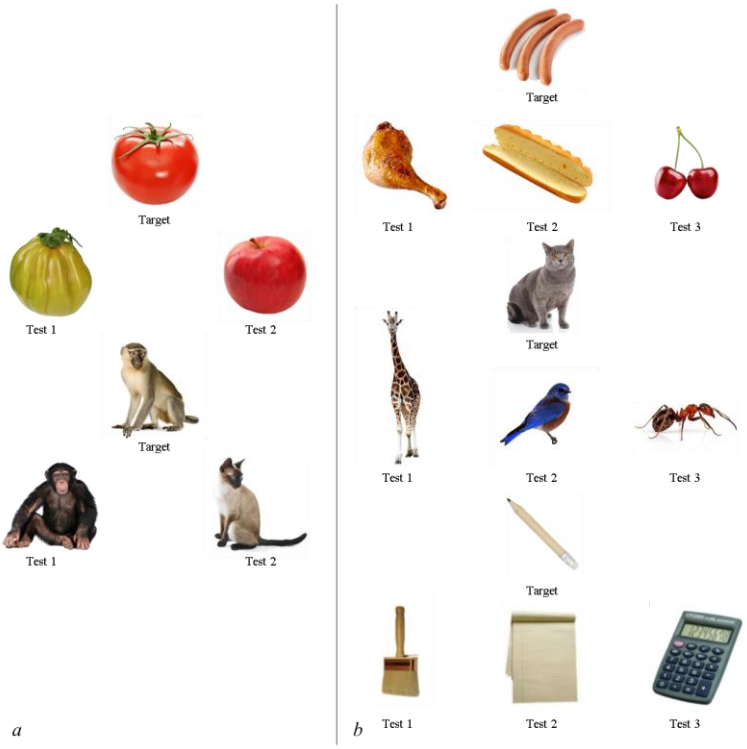

Figure 1: Examples of stimuli in study 1 (*a*) and 2 (*b*).

Two independent groups of 22 adults participated in rating tasks to ensure that each item belonged to the test type it was hypothesized to belong to, that is either taxonomically related or perceptually related. Each group was shown 23 triads in the same format as in the actual task (a target and two test items) in a counterbalanced order. The first group was asked to rate on a 7-point Likert scale to what extent each test belonged to the same taxonomic category as the target. The second group rated perceptual similarity between each test and the target on a 7-point Likert scale. For taxonomic ratings, we kept the triads with *test item 1*'s taxonomic ratings (M = 5.91, SD = 0.51) significantly higher than the taxonomic ratings of *test item 2* (M = 2.79, SD = 0.45; t = 20.51, 95% CI mean difference [2.79, 3.45], $p < .001$, d = 5.69). For perceptual similarity ratings, we kept the triads with *test item 2*'s perceptual similarity ratings (M = 5.18, SD = 0.71) significantly higher than the perceptual similarity ratings of *test item 1* (M = 3.39, SD = 0.96; t = 20.51, 95% CI mean difference [0.38, 0.96], $p < .001$, d = 1.31).

For each triad presented, children were told a blank property about the target and asked among the two tests which has also the property. To ensure that the children did not draw on prior knowledge to make these decisions during the task, we used blank properties, as in Rioux et al. (2018a), such as '*contains eget'*, taken from the Novel Object & Unusual Name database (NOUN; Horst & Hout, 2016). Triads were presented in a randomized order, which differed for each participant. For each item, a score of 1 was given when children successfully generalized the property to the taxonomic choice, *test item 1*, and a 0 score when they chose the perceptual choice, *test item 2*. In our study, the properties

to be generalized were biological properties, and children generalize these kinds of properties to taxonomically related categories (Coley et al., 2005; Nguyen & Murphy, 2003; Thibaut et al., 2016).

Statistical analysis

All analyses were performed using the R environment (R Core Team, 2021). Initially, potential moderating effects of gender were examined using independent samples *t*-tests with a Bonferroni-adjusted alpha level of $p \leq .0150$, revealing no differences in age, food neophobia and generalization scores among children (all $p > .7$).

Children's Generalization scores were analyzed using a generalized linear mixed-effects model with a binomial distribution to assess the probability of generalizing the blank property. Random factors included Participants and Triads to account for shared variance within subjects and stimuli. Fixed effects encompassed Gender, Age, Food neophobia, Domains, and the interaction between Food neophobia and Domains. To determine whether food neophobia is domain specific, BF_{01} were used to assess whether the data provided stronger evidence for an interaction between Food neophobia and Domain (supporting the alternative hypothesis) or for no interaction (supporting the null hypothesis)[1].

Results

Mean Generalization scores was 0.494 (*SD* = 0.16). The generalized linear mixed-model with Generalization scores as the dependent variable revealed that Age (β = 0.187, 95% CI [-0.014, 0.388], z = 1.82, p = .068, 95% CI OR [0.986, 1.473], BF_{01} = 0.38), and Domain (β = 0.822, 95% CI [-0.118, 1.763], z = 1.71, p = .087, 95% CI OR [0.172, 1.126], BF_{01} = 0.61) did not exhibit significant effects. However, there was a significant negative effect of Food neophobia (β = -0.040, 95% CI [-0.066, -0.013], z = -2.96, p = .003, 95% CI OR [0.936, 0.987], BF_{01} = 0.23), suggesting that neophobic children were less likely to generalize the property to the taxonomic match compared to their more neophilic counterparts. Importantly, the interaction between Food neophobia and Domains was not significant (β = -0.006, 95% CI [-0.042, 0.035], z = -0.28, p = .782, 95% CI OR [0.955, 1.035], BF_{01} = 3.36), suggesting that the impact of food neophobia on inductive reasoning was not specific to the food domain (see Figure 2*a*).

Discussion study 1

The first study explored the association between food neophobia and category-based inductive reasoning in the domains of food and animals. It revealed a negative relationship between food neophobia and induction performance, in both conceptual domains, food and animals. These results suggest that neophobic children's inductive reasoning difficulties, compared to their neophilic peers, extend beyond the food domain.

These results are important, even though we only assessed children's inductive reasoning. In order to extend the generality of the relationship between food neophobia and category-based abilities across domains, in a second study, we used another task assessing cross-categorization. We employed the double choices cross-categorization task that was introduced by Blaye and Jacques (2009). This task investigates children's capacity to sequentially associate a target item with two distinct categorical choices—either a taxonomic choice or a thematic choice. We tested the specificity of the association with food neophobia, comparing three conceptual domains, food, animals, and artifacts.

Building on study 1 results and Rioux et al.'s (2018b) findings on the negative association between food neophobia scores and category-based abilities, we hypothesized a negative correlation between food neophobia and children's flexibility scores. We anticipated that there would be no moderating effects of domains on this relationship.

Method study 2

Participants

Participants were 112 children (57 girls; age range = 4.42 to 6.33 years; mean age = 5.45 years; SD = 0.573). Informed consent was obtained from their school and their parents. The procedure was in accordance with the Declaration of Helsinki and followed institutional ethics board guidelines for research on humans. None of these children participated in Study 1.

Materials and procedures

As in the previous study, the caregivers filled out the CFRS to evaluate their child's food neophobia (mean = 16.3, *SD* = 5.25).

The cross-categorization task We constructed 18 stimuli made of 4 color photographs, divided into 6 food, 6 animals and 6 artifacts. Each stimulus was presented on a laminated A4 sheet displayed horizontally with the target at the top and centered, and three tests on the same line below the target (see Figure 1*b*). Among these three tests, *test item 1* was a superordinate taxonomic choice, *test item 2* was a thematic choice, and the remaining one was an unrelated *item 3*. The spatial location (left, middle, or right) of the three types of tests (taxonomic, thematic, or unrelated) was counterbalanced. Two additional stimuli were used as training trials.

Three independent groups of adults participated in rating tasks to ensure that each item in the three types of test items belonged to the test type it was hypothesized to belong to. Each group was shown 44 stimuli in the same format as in the actual task (a target and three potential tests) in a counterbalanced order. The first group (n = 60) rated, on a 7-point Likert scale, the extent to which each test belonged to the same taxonomic category as the target. The second group (n = 55) rated, on a 7-point Likert scale, the extent to which each test was frequently associated in the same context with the target (i.e., whether the target and the test often appear *together* in the same context), for thematic classification. The third group (n = 67) rated perceptual similarity between each test and the target on a 7-point Likert scale. For all three tests,

[1] $BF_{01} < 1/3$ indicates substantial evidence for the alternative hypothesis, whereas $BF_{01} > 3$ suggests substantial evidence for the null hypothesis (Wagenmakers, 2007).

we only kept stimuli with ratings significantly lower than 4 for perceptual similarity, to avoid giving an additional perceptual classification choice. For taxonomic ratings, we kept stimuli with taxonomic ratings significantly lower than 4 for non-taxonomic choice and a taxonomic rating beyond 4 for the taxonomic choice, *test item 1*. For thematic ratings, we kept stimuli with thematic ratings significantly lower than 4 for non-thematic choices and significantly beyond 4 for the thematic choice, *test item 2*. All *ps* < .05.

We presented the 29 preselected pictures to 15 children that did not participate in the study (mean age = 5.06 years, *SD* = 0.44) to ensure that the selected stimuli would be easily recognizable. The children were asked to help a character, Feppy, who could not remember the name of the stimuli. They were specifically instructed to recall the objects' name. For the food category, Feppy needed assistance with grocery shopping because he forgot what he had at home. Regarding animals, they were told that Feppy could not remember the animals near his house. For artifacts, children were told that Feppy struggled to recall the objects he had at home. Subsequently, the children were asked to identify the objects in the pictures and, if possible, provide their names. The presentation order of the pictures was randomized. A score of 1 was assigned when children could name the object or express recognition (e.g., understanding its function). Only pictures with a recognition score exceeding 90% were kept in the final set of 18 stimuli.

The task began with two training trials. In each trial, children were asked to select two tests for each target. For their First Selection, children were told (in French), "Look at this (the experimenter pointing to the target). Can you show me, among these three (the experimenter designing the potential tests), the one that goes best with this one (pointing again to the target)? To show me, place this coin on top of the one you chose." For their Second Selection, they were told, "Now there are only two left. Can you show me out of these two (designing the choices without coin), which goes better with this one (pointing to the target)? Here is another coin to indicate your choice". If children selected the unrelated test for either selection in the demonstration trials, they received corrective feedback in that the coin was moved to the correct associate. The order of the two demonstration trials was counterbalanced across participants. After the two demonstration trials, 16 test trials were presented with no corrective feedback. For each trial, a score of 2 was given when children successfully selected both the taxonomic and thematic choices. A score of 1 was given when children successfully selected one of the two correct tests (i.e., taxonomic or thematic) but chose the unrelated *test item 3*, during their Second Selection. Finally, a score of 0 was given when children selected the unrelated *test item 3* at their First Selection.

Statistical analysis

All analyses were performed using the R environment (R Core Team, 2021). Potential moderating effects of gender were examined using independent samples t-tests with a Bonferroni-adjusted alpha level of $p \leq .0150$, revealing no differences in age food neophobia and flexibility scores among children (all $p > .1$).

Children's Flexibility scores were analyzed using a linear mixed-effects model. Participants were considered a random factor. Fixed effects comprised Gender, Age, Food neophobia, Domains, and the interaction between Food neophobia and Domains. We conducted BF_{01} analysis to investigate whether food neophobia is domain specific (alternative hypothesis) or not (null hypothesis)[1]. Tukey's HSD was used to adjust for multiple comparisons.

Results

Mean Flexibility scores was 1.43 (*SD* = 0.28). The linear mixed-model with Flexibility score as the dependent variable revealed that Age had a significant main effect ($F = 15.76$, $\beta = 0.172$, 95% CI [0.087, 0.257], $p < .001$, $d = 0.770$, $BF_{01} = 0.04$), indicating that older children were better at associating items based on different categorical relationships than younger children. Additionally, there was a Domain effect ($F = 4.45$, $p = .013$, $BF_{01} = 0.13$). Children were better at flexibly categorizing food items ($M = 1.50$, $SD = 0.39$) than artifact items ($M = 1.38$, $SD = 0.35$, $t = 2.93$, $p_{Tuckey} = .010$). The scores for animals ($M = 1.42$, $SD = 0.39$) did not differ from food's ($t = 0.99$, $p_{Tuckey} = .010$) and artifacts' ($t = -1.94$, $p_{Tuckey} = .129$). A significant negative effect of Food neophobia was observed ($F = 4.10$, $\beta = -0.010$, 95% CI [-0.019, -2.78^{-4}], $p = .045$, $d = -0.143$, $BF_{01} = 0.54$), suggesting that neophobic children encountered greater difficulties in flexibly categorizing items based on different categorical relationships compared to their neophilic counterparts. Last, importantly, the interaction between Food neophobia and Domains was not significant ($F = 0.115$, $p = .892$, $BF_{01} = 4.17$), suggesting that the impact of food neophobia on cross-categorization performance is not specific to the items tested (see Figure 2*b*).

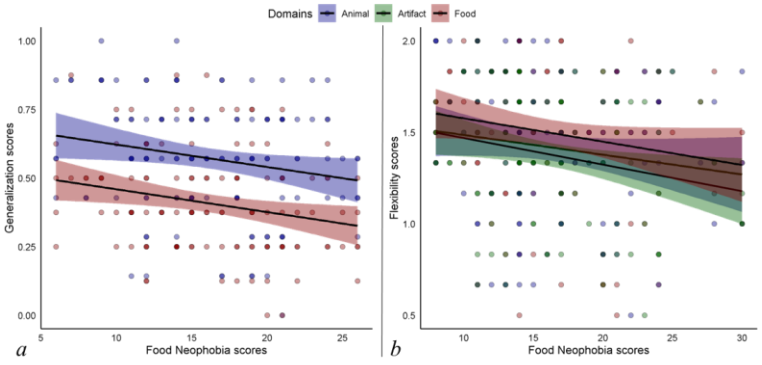

Figure 2: Interaction between Food Neophobia and Domains in study 1 (*a*) and 2 (*b*).

Discussion study 2

The second study employed a double choices cross-categorization task to build upon the findings of the first study. It aimed to explore whether the negative relationship

[1] $BF_{01} < 1/3$ indicates substantial evidence for the alternative hypothesis, whereas $BF_{01} > 3$ suggests substantial evidence for the null hypothesis (Wagenmakers, 2007).

between food neophobia and cross-categorization was specific to food.

The results confirmed study 1's results and revealed a negative association between children's food neophobia levels and cross-categorization scores across the three domains—food, animals, and artifacts. This suggests that food neophobia is associated with general category-based abilities rather than being limited to the domain of food or perceived novelty.

General Discussion

These studies aimed to explore whether the observed relationship between food neophobia and category-based abilities in preschoolers is tied to items' perceived novelty or to a more general cognitive rigidity. To investigate this, we tested children's category-based abilities with familiar items from different domains (i.e., food, animals, and artifacts). In study 1, children were tested on a blank property generalization task with food and animals, in which they had to generalize a target property to either a taxonomic match from the same basic level category or to a perceptual match from another category. Study 2 was a cross-categorization task (selection of two items, taxonomically or thematically related to a target against an unrelated item) in three conceptual domains, food, animals and artifacts.

As expected, both tasks revealed a significant and negative association between food neophobia and category-based abilities performance. The most important finding, however, was that for both tasks this negative relationship appeared in all the conceptual domains, including animals and artifacts.

Our results extend Rioux et al.'s (2018b) findings who used unfamiliar stimuli, by using familiar stimuli in our experiments. Thus in our case, it is unlikely that neophobic children performed poorly in both tasks due to a fear of novelty (Maratos & Sharpe, 2018; Moding & Stifter, 2016), making them less prone to engage with a variety of items across different domains and, consequently, less likely to develop knowledge about these items. Indeed, the idea that neophobic children performed more poorly than their neophilic peers due to a lower recognition of items is unlikely, since study 2 consisted of items recognized by children within the same age range at a rate exceeding 90%.

Our results are compatible with Foinant and colleagues' recent hypothesis (2022b), suggesting that preschoolers' food neophobia influences category-based abilities, not from a lack of knowledge, but rather from cognitive rigidity in utilizing their knowledge structures, such as categories and conceptual relations. The authors found a negative correlation between food neophobia and executive functions, particularly cognitive flexibility, in preschoolers. Executive functions are important for identifying conceptually relevant dimensions and selecting appropriate conceptual representations (Blaye & Jacques, 2009; Lagarrigue & Thibaut, 2020). Recent evidence from Pickard et al. (2023) supports this idea, indicating that neophobic children struggle to switch between appropriate conceptual relations when contextual demands change. This failure to switch may not be due to a lack of knowledge as initially hypothesized by Rioux et al. (2016; 2018a) but rather an inability to flexibly consider one stimulus from different semantic perspectives. Indeed, our findings from study 2 suggest that once neophobic children establish a categorical association (e.g., taxonomic), they may struggle to switch to another association (i.e., thematic). In study 1, it is plausible that neophobic children encounter difficulty inhibiting attention from perceptual matches or transitioning to taxonomic matches. Future studies should measure children's executive functions to examine whether they mediate the relationship between food neophobia and performance in tasks testing category-based abilities.

We acknowledge that the present research has some limitations. Firstly, while we ensured that children within the same age range could recognize the stimuli, we did not directly ask the children participating in the studies to name the items. Therefore, neophobic children may have demonstrated a comparatively lower ability to identify items across all domains than their neophilic peers. However, this seems unlikely based on prior studies, which found no significant correlation between food neophobia and semantic organization (Rioux et al., 2018a), food identification (Pickard et al., 2021), or factual knowledge about the world (Foinant et al., 2022b). Secondly, we did not assess the cultural background of the children. Thematic associations tested in study 2 were representative of typical associations for French individuals. However, for children from different cultures, these associations may not have been representative or easily understood.

Despite these limitations, this research opens up promising new avenues of research. The most important finding is that specific child individual differences can undermine category-based abilities development. This research also challenges the current conceptualization of food neophobia. Traditionally operationalized as the reluctance or fear of trying new foods (Pliner & Hobden, 1992), food neophobia has long centered on the notions of novelty and familiarity. While initially linked only to unfamiliar food items, recent studies have broadened the concept to include items perceived as novel due to changes in appearance or context (Pickard et al., 2021; Rioux et al., 2017). Our study goes further by suggesting that food neophobia, rather than being defined by items' novelty, represents a cognitive rigidity limiting children's ability to view items differently once classified from one perspective, even across domains. In the case of food, novel fruits and vegetables, by default, are often classified as *"bad"* or *"yucky"* by children (Johnson et al., 2018), making it challenging for the most neophobic individuals to change their perception even with repeated exposures (Rioux et al., 2018c; Williams et al., 2008).

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