

# Applying a systems perspective to understand the mechanisms of the European School Fruit and Vegetable Scheme

**Author(s):** Mahshid Zolfaghari<sup>1</sup>, Biljana Meshkovska<sup>1</sup>, Anna Banik<sup>2</sup>, Carlijn B.M. Kamphuis<sup>3</sup>, Birgit Kopainsky<sup>4</sup>, Aleksandra Luszczynska<sup>2</sup>, Celine Murrin<sup>5</sup>, Nanna Lien<sup>1</sup>; on behalf of the **PEN consortium**

## Introduction

- For the past two decades, the percentage of European children who consume fruit daily has remained at around 40%.
- School-based policy efforts like European school fruit and vegetable scheme (the Scheme) has had limited impact on children's fruit and vegetable (FV) consumption.
- This study aimed to apply a systems approach to provide an integrated perspective of the mechanisms of the Scheme to understand better how to increase its long-term impact on children's FV consumption.

## Method

- Data collection:** peer-reviewed articles and documents of national governments related to the Scheme.
- Data analysis:** The coding approach was based on a method developed and applied in system dynamics to translate textual data into causal loop diagram.
- Model validation:** Experts (two individuals and a group) in school-based FV programmes, children's FV consumption, and the Scheme were consulted to validate the initial causal loop diagrams following the disconfirmatory interview guidelines.

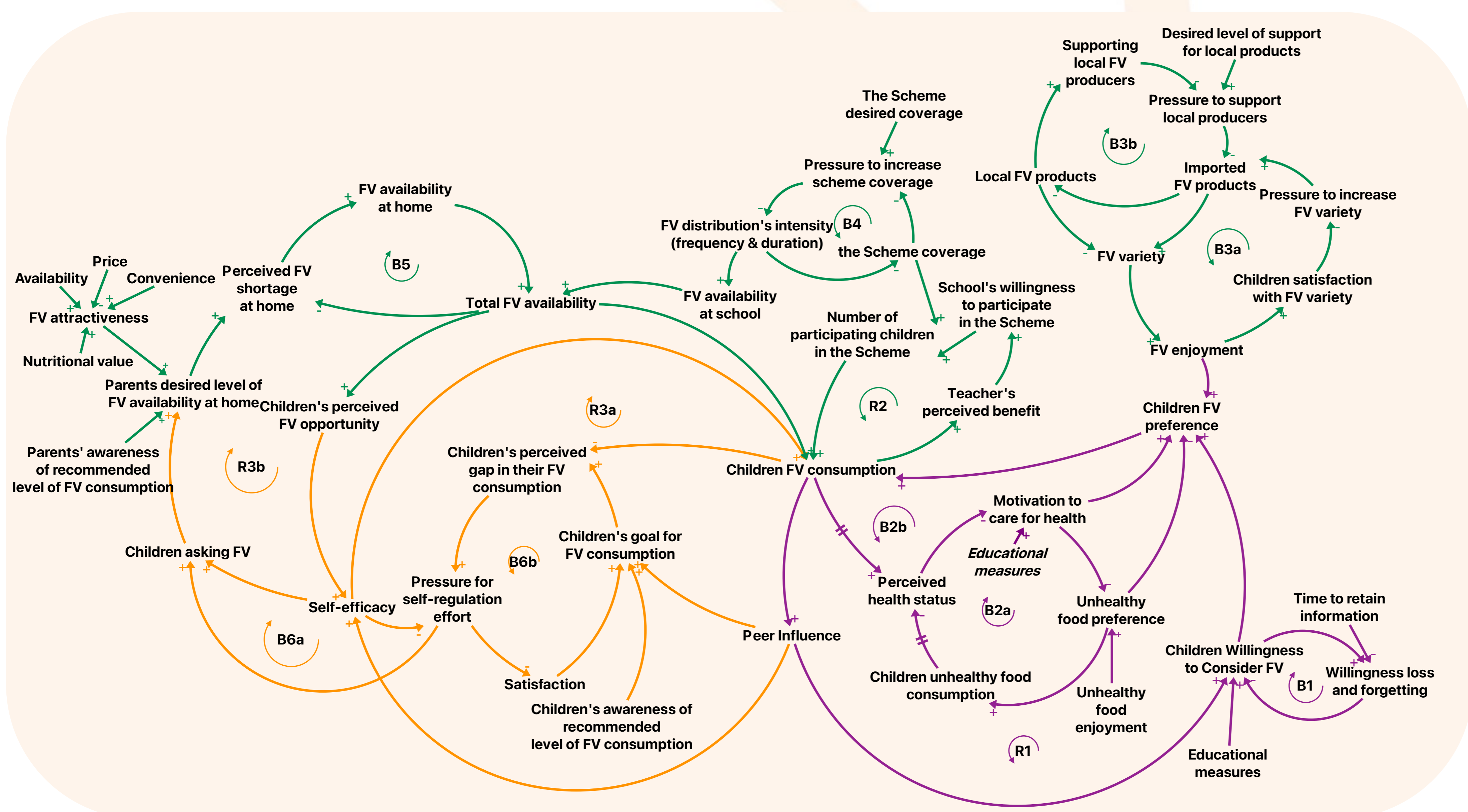


Figure 1. A complete view of causal loop diagram (CLD) illustrating the motivation (purple), opportunity (green), and capability (orange) mechanisms regarded as important in influencing children's FV consumption in the Scheme.

A CLD visualises the interconnections among variables as well as feedback loops (FBL). For each arrow, the polarity indicates whether variables move in the same (positive sign) or opposite (negative sign) directions (all else being constant).

There are two types of FBLs in a CLD: balancing FBLs (B), which oppose change introduced to the system, and reinforcing FBLs (R), which amplify change introduced to the system.

- (B) B stands for Balancing feedback loop
- (R) R stands for Reinforcing feedback loop

## Findings

- A central self-reinforcing mechanism through which children socialise during FV consumption is critical in the habituation process (loop R1, figure 1).
- The initial increase in children's FV consumption following the Scheme implementation is due to growth in three self-reinforcing loops related to motivation and capability mechanisms; however, this trend gradually slows and stops due to four balancing feedback loops with alternative goals related to opportunity mechanisms that reach their limits.

## Key points

- Factors influencing children's long-term FV consumption and the effectiveness of school-based FV policies are interrelated.
- The interrelated motivation, opportunity and capability mechanisms highlight the crucial role of multi-component interventions in addressing children's low FV consumption.
- Ensuring sustained opportunities for children to consume FV while strengthening motivation and capability mechanisms should be the main priority in school-based FV policy programmes.

**Affiliations:** 1. Department of Nutrition, University of Oslo, Oslo, Norway 2. Faculty of Psychology in Wroclaw, SWPS University of Social Sciences and Humanities, Wroclaw, Poland 3. Department of Interdisciplinary Social Science, Utrecht University, Utrecht, The Netherlands 4. System Dynamics Group, Department of Geography, University of Bergen, Bergen, Norway 5. School of Public Health, Physiotherapy and Sport Science, University College Dublin, Dublin, Ireland