

Submission for consideration in the Frontiers in Biorefining, 2024

Gauging the Public's perception of sustainability of paper packaging containing recovered materials

Sophie Van Schoubroeck^a, Lisandra Chacon^b, Autumn M. Reynolds^b, Nathalie Lavoine^b, Marko Hakovirta^b, Ronalds Gonzalez^b, Steven Van Passel^a, Richard A. Venditti^{b,*}

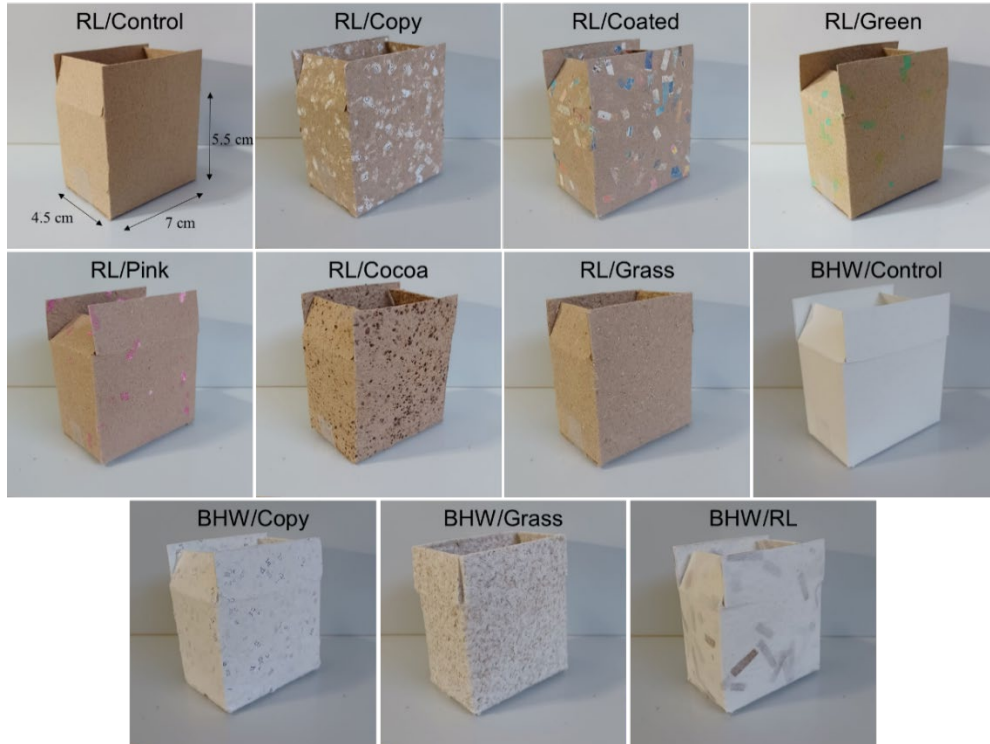
^a*University of Antwerp, Department of Engineering Management, Prinsstraat 13, 2000 Antwerp, Belgium.*

^b*Department of Forest Biomaterials, College of Natural Resources, North Carolina State University, Raleigh, NC 27695-8005, USA *-corresponding and presenting author.*

ABSTRACT

This study explores consumers' visual sustainability impressions of paper-based packaging that has incorporated in it obvious waste/recovered material content. Two research questions were addressed concerning (1) the environmental sustainability perception of noticeable waste content in packaging and (2) the impact of the presentation format (i.e., online versus in-person surveys) when studying these perceptions. Paper samples (small boxes) with either bleached or unbleached recycled brown fibers were created that included switchgrass, cocoa bean shells, or several types of recovered printing and writing grade paper waste particles, separately. Best-worst scaling experiments were conducted, which made respondents (i.e., 487 online responses and 211 in-person responses) choose the 'most' and 'least' environmentally friendly package. Packages were designed using paperboard substrates blending either brown linerboard or white hardwood pulp with different recovered waste materials. The results showed that consumers perceive obvious waste-containing packaging as more environmentally friendly than classical packaging (with no visual waste). Samples with a brown base and agricultural waste were perceived as more sustainable compared to white packaging and the use of paper waste. It was found that the environmental sustainability perception of certain packages differed between age groups and respondents with a different educational background. In addition, the presentation delivery method (whether real samples were presented to people in-person or digital images were shown to people online) changed the respondents' perception of the products and should therefore be carefully considered when designing surveys pertinent to bioproducts.

(figure on next page)



Boxes used for the survey.