

Temporal orientation and sustainable wine choice behaviour

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Abstract

Purpose – The aim of this study is to examine how individual differences in temporal orientation influence consumer preferences and choice consistency for wine sustainability attributes.

Design/methodology/approach – We conducted a discrete choice experiment to estimate willingness to pay for different sustainability labels on wine bottles, using a representative sample of 500 Italian wine consumers. We measured temporal orientation using the Consideration of Future Consequences scale.

Findings – Results show that temporal orientation affects both the evaluation of sustainability attributes and the consistency of choices across different decision contexts. Future-oriented individuals tend to place a higher value on sustainability attributes, focusing on more abstract, value-oriented benefits, while present-oriented individuals do not value sustainability attributes as much and tend to be less consistent in their choices.

Practical implications – These findings carry relevant managerial and policy implications. From a marketing perspective, firms should align the temporal focus of their messages with that of their target consumers. From a policy standpoint, temporal orientation should be considered as a moderating factor in the *ex ante* evaluation of labelling schemes.

Originality/value – This is the first study to investigate the relationship between temporal orientation and consumers' preferences for sustainability in the wine industry, and to link temporal orientation to the consistency of consumers' choice behaviour.

Keywords Construal level theory, Discrete choice experiment, Temporal orientation, Sustainable consumption

Paper type Research article

1. Introduction

From a consumer perspective, sustainability involves navigating inherently complex decision-making processes that require balancing immediate costs against long-term benefits (Arnocky *et al.*, 2014). At its essence, sustainable consumption embodies a conflict. Consumers must address the temporal dilemma of discounting long-term benefits, such as environmental preservation or social equity, against the tangible and immediate costs associated with pro-sustainability behaviours (Fuller *et al.*, 2022; Joireman *et al.*, 2001; Milfont *et al.*, 2012).

Construal level theory (CLT) offers a theoretical foundation for understanding the cognitive mechanisms underlying intertemporal decision-making (Liberman *et al.*, 2007;



Trope *et al.*, 2007; Trope and Liberman, 2010). CLT posits that psychological distance – whether temporal, spatial, social and hypotheticality dimensions – determines the level of abstraction in individual mental representations. Events or decisions perceived as distant are construed at a high level, focusing on desirability and overarching goals, whereas proximal decisions are evaluated through a low-level construal, emphasising feasibility and concrete details (Trope and Liberman, 2003). Consequently, the effect of distance on consumer decision-making process depends on whether utility stems from high-level desirability features or low-level feasibility features of the good (Fiedler, 2007; Liberman *et al.*, 2007). CLT has been used to analyse a range of economic behaviours (Leiser *et al.*, 2008), and it has also provided a theoretical basis for understanding why consumers exhibit more or less pro-environmental behaviour (see Vergura *et al.*, 2023, for a review).

Previous research has predominantly used a specific dimension of psychological distance that is temporal orientation to examine the extent to which consumers engage in (or refrain from) pro-environmental behaviour (see Maiella *et al.*, 2020, for a review). Specifically, the construal of temporal orientation serves as an indicator of individuals' cognitive predisposition to adopt either a high- or low-level construal, depending on their temporal frame of reference (Joireman *et al.*, 2012). Future-oriented individuals, who consider the long-term consequences of their actions, are more likely to engage in high-level construal, focusing on abstract and overarching goals (Joireman *et al.*, 2004; Milfont *et al.*, 2012). In contrast, present-oriented individuals, who prioritise immediate rewards, tend to adopt low-level construal, concentrating on concrete and short-term benefits (Lee and Zhao, 2014). As climate change and environmental damage are often perceived as distant and abstract, an individual's temporal orientation is likely to affect their commitment to making sustainable choices (Spence *et al.*, 2012; Park *et al.*, 2020; Wang *et al.*, 2019).

Previous studies examining the relationship between temporal orientation and pro-environmental behaviour have produced mixed results. Some studies have found that temporal orientation does not influence consumers' sustainable choices (e.g. Park *et al.*, 2020; Wang *et al.*, 2019), while others have found that it does (e.g. Jones *et al.*, 2017; Spence *et al.*, 2012; Brügger *et al.*, 2016). This leaves the question open empirically. In this study, we address it by conducting a choice experiment (CE) to elicit consumers' preferences for sustainable wine attributes. Specifically, we examine how these preferences are influenced by consumers' temporal orientation, which we measure using the Consideration of Future Consequences (CFC) scale (Strathman *et al.*, 1994).

The selection of wine allows us to explore this question within the context of a high-involvement food category, where purchase decisions are more intricate than routine grocery choices (Barreiro-Hurlé *et al.*, 2008). The motivations behind wine consumption include intrinsic product qualities (e.g. organoleptic properties), extrinsic cues (e.g. awards and expert reviews) and emotional or social connections to the region where the wine is produced (Rabadán and Bernabéu, 2021; Capitello *et al.*, 2021; Costanigro *et al.*, 2025).

The literature has already devoted substantial attention to understanding how sustainability attributes intertwine with this rich set of intrinsic, extrinsic, and symbolic factors (see Gastaldello *et al.*, 2025, for in-depth literature review). Overall, findings show that consumers are, on average, willing to pay a premium for sustainable wines. However, to our knowledge, no previous study has examined whether this premium is influenced by psychological distance, specifically, by individual temporal orientation.

Our study fills this gap. We hypothesise that consumer preferences for sustainable goods are influenced by individual differences in temporal orientation, which shapes how sustainability product's attributes are processed and evaluated. Specifically, we aim to explore whether temporal orientation affects two distinct dimensions, i.e. the heterogeneity in preferences for sustainability attributes and the consistency of individual choices. To this end, we estimated a Generalised Multinomial Logit (GMNL) model, which extends the standard random-utility framework by accounting for both unobserved taste heterogeneity and scale heterogeneity across individuals. This approach captures not only how temporal orientation

2. Methodology and experimental design

Data were collected through an online survey involving 500 Italian wine consumers. A marketing agency (Toluna Inc.) recruited participants and administrated the survey in April 2021. Participants were eligible if they were over 18 years of age and were wine consumers who had purchased at least one bottle of wine in the previous 12 months; those who reported never consuming wine were excluded during recruitment [1]. Descriptive statistics of the sample are reported in [Appendix 1](#).

Data on consumers' preferences were collected using a CE approach. A CE consists in presenting to respondents several purchasing scenarios composed of two or more alternative products where they must select the most preferred alternatives. The alternatives are described by quality attributes and prices. We selected five attributes to include in the experiment: the price (a reference level, -20%, +20%, +40%), a fair labour condition claim (absence, presence), a 100% recycled glass label (absence, presence), the organic label (absence, presence) and the Wine Spectator quality score (80/100, 95/100). The attribute selection process is detailed in [Appendix A](#).

A Bayesian D-efficient heterogeneous design ([Sándor and Wedel, 2002, 2005](#)) was used to allocate attributes and attribute levels among alternatives. The design aimed to minimise the Bayesian D-error, defined as the determinant of the inverse of the expected Fisher Information Matrix. Under this approach, the expected information matrix is computed by averaging multiple simulated draws from prior distributions of the utility coefficients. Prior means and standard deviations were derived from a pilot study involving 78 respondents. The final design was generated using the software Ngene. As a result, each participant faced eight choice tasks. Every choice task included two unlabelled alternatives of wine plus a no-buy option, allowing respondents to opt out of purchasing. The inclusion of the no-buy alternative ensured a more realistic decision context and prevented forced choices. An example of a choice task used in the experiment is reported in [Appendix A, Figure A1 \[2\]](#). The measures reported in this study were part of a more extensive study on sustainability labels; for more details on the experimental design of the CE, see [Piracci et al. \(2022\)](#).

Time preference was measured using the mean score from the Consideration of Future Consequences (CFC) scale by [Strathman et al. \(1994\)](#), a validated scale of 12 items designed to assess the tendency of individuals to prioritise future outcomes over immediate ones related to their behaviour and consumption. The CFC provides a domain-specific construct that quantifies individual differences in temporal orientation ([De Marchi et al., 2016](#)). CFC captures the extent to which individuals prioritise the potential distant outcomes of their current behaviours and the degree to which they are influenced by these potential outcomes ([Joireman et al., 2004; Strathman et al., 1994](#)). It is conceptualised as an attitudinal construct that reflects beliefs oriented towards domain-specific consequences, implying that individuals may exhibit a future-oriented perspective in certain behavioural domains while remaining present-oriented in others ([Murphy et al., 2020; Nystrand et al., 2021](#)).

The CFC scale includes two sets of items that gauge two dimensions, CFC-Future (five items), which measures how much individuals value future outcomes of their decisions; and CFC-Immediate (seven items), which assesses the tendency to focus on immediate benefits of consumers choice, often without weighing the future consequences. To measure these dimensions, we asked participants to rate their degree of accordance to a series of statements on a 5-point Likert scale (ranging from "strongly disagree" to "strongly agree"). The full scale is reported in [Appendix B](#).

Data were analysed as follows. According to the random utility model ([McFadden, 1974](#)), the utility that consumer i derives from the wine alternative j in the choice situation t can be written as follows:

$$U_{ijt} = \beta'_i \mathbf{x}_{ijt} + \varepsilon_{ijt} \quad (1)$$

Where β' is the vector of the utility parameters of the observed attributes $\mathbf{x}_t$ of the wine alternative j and ε_{ijt} is the idiosyncratic error. The parameters were estimated using a Generalized Multinomial Logit type II model (GMNL) developed by [Fiebig et al. \(2010\)](#). This model extends the standard Mixed Logit by allowing variation in both preference parameters and the variance of the unobserved utility component. Accordingly, we can write the individual β coefficients as:

$$\beta_i = \sigma_i (\beta + \eta_i) \quad (2)$$

and

$$\sigma_i = \exp(\bar{\sigma} + \tau \nu_i) \text{ with } \nu_i \sim N(0, 1) \quad (3)$$

where β is the vector of mean attribute utility weights in the population; η_i is the vector of individual-specific deviations from the mean; σ_i is the scaling factor with mean 1 and variance equal to τ . As σ_i may be heterogeneous based on observed respondents' characteristics z_i , we can write its specification as follows:

$$\sigma_i = \exp(\bar{\sigma} + \theta z_i + \tau \nu_i) \quad (4)$$

We explore the role of time preference in explaining the consumer choices for sustainability attributes in wine implementing three GMNL models. In Model 1, we estimated preferences for wine sustainability attributes. In Model 2, we added to the main effects specification a set of interaction terms between non-price attributes and the two dimensions of the time preference. The sign and significance of interaction-term parameters estimate the impact of the time preference heterogeneity on the preference for the sustainability attributes. As a robustness check, we estimated Model 1 and Model 2 also using a Random Parameter Logit; results are reported in [Appendix C](#).

Finally, in Model 3, we introduced the CFC-Future and CFC-Immediate scores as covariates z of scale factor in [Eq. \(4\)](#). The sign of θ indicates the direction of the observed scale heterogeneity: a positive value implies that the associated covariate increases the scale parameter, leading to more deterministic and consistent choices; a negative value indicates a reduction in scale, corresponding to greater unobserved variance in utility and, consequently, higher decision noise. In all three models, the parameters are assumed to be normally distributed except for price, which is assumed to follow a constrained (one-sided) triangular distribution. This distribution allows the negative sign of the price coefficient to reflect behavioural realism ([Hensher and Greene, 2003](#)). The data analysis was conducted using NLOGIT 6.

3. Results

Before the examination of the impact of time perspectives on consumer preferences for wine sustainability attributes, we assessed the reliability of the CFC scale and its subscales. In [Table 1](#) we reported their descriptive statistics and reliability coefficients. The overall CFC scale demonstrated good internal consistency (Cronbach's $\alpha = 0.77$). The CFC-Future and CFC-Immediate subscales also showed satisfactory internal consistency with a Cronbach's α equal to 0.74 and 0.87, respectively. These results indicate that the CFC scale and its subscales are suitable for measuring individual differences in time perspective in the context of this study [\[3\]](#).

Table 1. Descriptive statistics and reliability coefficients of the CFC scale and its subscales

Variable	Mean	Std. dev.	Cronbach's α
CFC-Future	3.80	0.60	0.74
CFC-Immediate	2.91	0.84	0.87
CFC (Overall)	3.28	0.55	0.77
Note(s): Std. dev. Standard deviation			
Source(s): Authors' own work			

The results from Model 1, reported in Table 2, show that all the estimated coefficients are statistically significant at 99%. The strongly negative and significant coefficient for the no-buy

Table 2. Results of the GMNL models for each model specification

	Model 1		Model 2		Model 3	
	Coeff.	SE	Coeff.	SE	Coeff.	SE
<i>Random parameters in utility functions</i>						
Organic label	1.95***	0.25	0.36	0.24	0.76*	0.31
Fair Labor label	1.63***	0.18	0.41	0.21	0.69*	0.28
Recycled glass bottle	1.15***	0.14	0.31	0.18	0.48*	0.21
Wine Spectator score	0.93***	0.13	0.57***	0.21	0.26*	0.12
Price	−0.42***	0.06	−0.35***	0.02	−0.31*	0.12
<i>Nonrandom parameters in utility functions</i>						
No buy	−5.56***	0.34	−5.52***	0.17	−4.28***	0.11
CFC-Future × Organic label			0.36***	0.08		
CFC-Future × Fair Labor label			0.29***	0.07		
CFC-Future × Recycled glass bottle			0.14*	0.06		
CFC-Future × Wine Spectator score			0.17***	0.06		
CFC-Immediate × Organic label			−0.12	0.09		
CFC-Immediate × Fair Labor label			−0.12	0.07		
CFC-Immediate × Recycled glass bottle			0.00	0.06		
CFC-Immediate × Wine Spectator score			−0.15*	0.06		
<i>Standard deviations</i>						
Organic label	2.18***	0.24	1.62***	0.15	2.96	2.13
Fair Labor label	1.70***	0.19	1.31***	0.13	8.77***	1.09
Recycled glass bottle	0.79***	0.21	0.66***	0.17	0.80	1.78
Wine Spectator score	1.21***	0.20	1.05***	0.12	10.93***	0.92
Price	0.42***	0.06	0.35***	0.02	0.31*	0.12
τ -scale variance	0.76***	0.07	0.73***	0.05	1.19***	0.08
<i>θ-scale correction factor</i>						
CFC – Future					0.10	0.10
CFC – Immediate					−0.23***	0.08
<i>Model characteristics</i>						
Log-likelihood function	−3101.134		−3090.52		−3360.23	
McFadden's pseudo R^2	0.29		0.30		0.24	
AIC	6224.27		6219.05		6746.46	
BIC	6293.50		6338.64		6828.29	
Note(s): * $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$. Coeff.: Coefficient; SE: Standard error; AIC: Akaike Information Criteria; BIC: Bayesian Information Criteria						
Source(s): Authors' own work						

alternative confirms a low propensity to opt out of purchase. This outcome is consistent with the composition of the sample, which included only wine consumers, and confirms that the experimental alternatives were perceived as realistic and relevant purchase options. The organic label has the largest positive coefficient (1.95), indicating that it exerts the strongest marginal effect on utility among all attributes. This is followed by the fair labour label (1.63) and the recycled glass bottle (1.15), which are also positively valued but to a lesser extent. The Wine Spectator score (0.93) is smaller in magnitude yet remains positive and highly significant. The significant standard deviations associated with all random parameters indicate substantial heterogeneity in individual preferences, suggesting that consumers differ markedly in the value they assign to both sustainability attributes and quality cues. Finally, the price coefficient (-0.42) is statistically significant with the expected negative relationship with utility.

Model 2 shows that all interaction terms between organic, fair labour and recycled glass bottle with the CFC-Future are positive and statistically significant at least to 95%. This indicates that individuals with stronger future orientation place a higher value on sustainability attributes. Instead, most CFC-Immediate interactions are negative but not statistically significant, showing that those who have a more pronounced orientation to immediate satisfaction do not have a significantly different preference for sustainability attributes. Additionally, the sustainability labels' main effect is not statistically significant. This means that the sustainability attributes of wine are primarily preferred by individuals who are more oriented towards the future consequences of their behaviour. Finally, the Wine Spectator score interactions with the CFC components are statistically significant: the interaction with the CFC-Future is positive, whereas the interaction with CFC-Immediate is negative, albeit significant at the 95% confidence level. This suggests that future-oriented individuals place high importance on the expert rating and, conversely, present-oriented people react negatively to it.

Model 3 shows similar results in terms of significance and sign of the coefficients of the choice attributes. The scale correction factor of CFC-Future is 0.10 and it is not statistically significant, meaning that the average scale in the utility of future-oriented individuals is not different from that of other consumers. Instead, the coefficient of CFC-Immediate is -0.23 , which is negative and statistically significant. This suggests that present-oriented individuals tend to exhibit a lower average scale in the utility, which indicates a higher choice inconsistency. This result implies that respondents with stronger present orientation make choices that are less deterministic and more random, plausibly influenced by unobserved factors. By contrast, the coefficient for CFC-Future is not statistically significant, suggesting that future-oriented individuals do not differ systematically in their choice consistency. The estimated τ parameter, capturing unobserved scale heterogeneity across individuals, is positive and significantly different from zero. This confirms the presence of residual variability in the scale parameter beyond what is explained by the included covariates, supporting the appropriateness of the GMNL specification over the Mixed Logit model.

4. Discussion and conclusions

Building on research linking temporal orientation to pro-environmental behaviour (Milfont *et al.*, 2012; Arnocky *et al.*, 2014), we investigated whether and how temporal orientation influences consumers' preferences for sustainability attributes in wine products. Our findings support the CLT by Trope and Liberman (2010) in terms of its temporal dimension. People with higher CFC-Future scores appear to process sustainability attributes at a higher construal level. This is consistent with our expectations concerning the relationship between temporal distance and decision-making. People who think more about the future tend to focus on more abstract, value-aligned features rather than immediate, concrete attributes and are therefore more likely to value sustainability attributes. In contrast, individuals who are more present-oriented do not tend to value sustainability more. Our findings extend the role of temporal

orientation beyond preference formation, linking it to the underlying structure of decision consistency. The significant association between present-oriented thinking and the scale parameter suggests that temporal orientation influences not only the direction and strength of preferences but also how consumers make their choice. In other words, future-oriented individuals tend to display more stable and internally consistent decision patterns, whereas present-oriented individuals exhibit greater random variation, indicative of less systematic information processing.

Given this, and consistent with evidence that temporal orientation shapes attribute evaluation (Pokharel *et al.*, 2023; Trope and Liberman, 2010), if a stakeholder's goal is to encourage pro-environmental behaviour or increase WTP for sustainability attributes, marketing should explicitly account for consumers' temporal orientation and match message framing accordingly (see Saeed *et al.*, 2024 for a review).

We therefore argue that effective marketing and communication campaigns should pursue temporal congruency – that is, align the temporal focus of the message with that of the consumer (White *et al.*, 2011). Given that future-oriented consumers respond more favourably to messages emphasising distant outcomes (e.g. long-term environmental impact, durability, primary product attributes), whereas present-oriented consumers are more receptive to near-term outcomes (e.g. immediate savings, convenience, secondary attributes) (Martin *et al.*, 2009), stressing the long-term environmental and social benefits of sustainable wines may appeal more to future-oriented individuals. At the same time, minimising the perceived immediate costs or inconveniences (e.g. concerns about taste or quality) linked to purchasing sustainable wines could increase their attractiveness among present-oriented consumers.

Practically, although precisely targeting consumers based on their temporal orientation is challenging, marketers could diversify message framing across communication channels – that aim at targeting consumers of a particular temporal orientation – for instance, using shorter, near-term cues on fast-scroll social media and longer, more detailed narratives in newsletters or on product webpages (Martin *et al.*, 2009). To reinforce this point, we found inconsistencies in the choices of presented-oriented individuals, which suggest more distracted decision-making. This makes it more likely that these consumers will rely on heuristics when making their purchasing decisions, favouring brief, concise information that highlights the immediate benefits of choosing a sustainable product.

Our results are not only relevant for marketing, but also for policy, particularly regarding information and labelling design. Previous studies on temporal orientation and food choices have shown that the effectiveness of front-of-pack nutrition information varies according to individuals' temporal orientation. For example, front-of-pack information tends to be more effective for consumers who are future-oriented (Rojas-Rivas *et al.*, 2020; Tórtora and Ares, 2018), whereas nutritional warnings are effective in discouraging unhealthy choices regardless of time perspective.

Although this evidence originates from a different context, it highlights the importance of considering the relationship between a label's effectiveness and temporal orientation within the sustainability labelling framework. The market is currently crowded with such labels (Piracci *et al.*, 2024), and the European Commission's Farm to Fork strategy seeks to address this by standardising green claims through a single, holistic sustainability label (European Commission, 2020). Policymakers should therefore account for temporal orientation when designing and testing such labels, as including it as a moderator in *ex ante* evaluations can improve assessments of consumer acceptance and WTP, and offer a relevant direction for future research.

5. Limitations and further research

The study presents some limitations. Our study focuses on Italian wine consumers, for whom wine holds a deep cultural and symbolic meaning. This may influence how sustainability attributes are perceived and valued. Recent work by Chauvin *et al.* (2025) shows that Italian consumers respond more negatively than British consumers to sustainable innovations such as

canned wine, highlighting the role of cultural expectations in shaping product acceptance. Similarly, [Agnoli and Outreville \(2021\)](#) report that wine consumption in Italy is strongly rooted in tradition, ritual and identity. For these reasons, our findings may not generalise to markets where wine consumption is less symbolically charged. However, we argue that testing the relationship between temporal orientation and sustainable wine choice in a context where cultural and emotional attachment to the product is particularly strong represents a robust test of the underlying behavioural mechanism.

Additionally, the specific sustainability attributes included in the experiment may not capture the full range of relevant dimensions. Future research could explore a broader set of attributes and test the robustness of our results across different contexts where wine plays a less central cultural role. Another relevant avenue for future research concerns the relationship between wine consumption frequency and decision consistency in choice experiments. While our study was not designed to test such a moderating effect, it would be worthwhile to examine whether low-frequency wine consumers, potentially less involved or knowledgeable, are more prone to inconsistent or heuristic-driven choices.

Lastly, our study focuses on stated preferences and hypothetical choices. While this is a common limitation of choice experiments, it highlights the need for future work to validate our findings using non-hypothetical stated preference methods or longitudinal field experiments.

Author contributions

Fabio Boncinelli: Conceptualisation, Data curation, Formal analysis, Methodology, Project administration, Software, Validation, Visualisation, Writing—original draft.

Mirta Casati: Validation, Visualisation, Writing-review and editing.

Giovanna Piracci: Conceptualisation, Investigation, Methodology, Validation, Visualisation, Writing-review and editing.

Ethics statement

All the authors declare that this study was conducted in accordance with the key principles and ethical standards stated in the Declaration of Helsinki. The collected data about food purchase behaviour and its determinants are not sensitive and are part of participants' day-to-day routines. Before the start of each interview, participants were informed that the survey was intended for research purposes, their participation was voluntary, they elicited their preferences in hypothetical scenarios, they could withdraw from the survey at any time without explanation or penalty, and all personal information would be kept confidential. The participants gave consent by taking part in the study. All responses were kept confidential. Data were anonymised and processed anonymously. At the time of data collection, no ethical approval was required in the country where the study was conducted, and no ethics committee was established at the authors' institution.

Informed consent

All participants provided written informed consent for their data to be used for research purposes in an aggregated form. This manuscript does not include any case details, personal information or images of individuals.

Data available statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Notes

1. 40.6% of respondents reported daily wine consumption, 47.0% consumed wine once or more per week, 10.0% consumed it once or more per month and only 2.4% consumed wine less than once per month.
2. The full experimental design is available from the corresponding author upon request.

3. We conducted an exploratory factor analysis (EFA) as a preliminary validation step to examine whether the established two-factor structure emerges in our data. The EFA confirmed the expected two-factor structure, with items loading cleanly on their respective factors.

Supplementary material

The supplementary material for this article can be found online.

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