



Consumers' opinions and use of food labels: Results from an urban – rural hybrid area in South Africa



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ABSTRACT

Food labels are often an important source of information available to guide consumers' in-store purchases. This study aimed to determine consumers' opinions about and use of food labels and the association between these constructs with structural equation modeling in an urban–rural hybrid area context. Results from the survey ($n = 912$) showed that respondents mainly had positive opinions about food labels as an information source and appreciated the importance of product and origin information. Most respondents indicated pre-purchase use of labels. The structural equation model confirmed an association between respondents' food label opinions and use and suggests that these opinions could be used to anticipate label use. It is thus important to offer label information that would evoke favorable opinions and that might directly contribute to consumers' decisions to purchase the product in-store.

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1. Introduction

Food packaging attracts consumers' attention in-store and communicates information that allows them to distinguish between product alternatives (Butkevičienė, Stravinskienė, & Rūtelionė, 2008) by means of attributes such as food labels. Labels can be tags, graphics or descriptive matter attached to a food product or package, including information needed for sales, disposal (South Africa, 2010) and consumption. For the purpose of this study food labels include information regarding ingredients, nutrition content, nutrition and health claims, expiry date, manufacturer, country of origin, preparation and storage instructions, product mass/volume and brand name. Food labels provide information to consumers that can considerably simplify their food purchase decisions which have become complex due to extensive and ever-changing product ranges (Prinsloo, Van der Merwe, Bosman, & Erasmus, 2012). Labels thus offer important pre-purchase information during decision making, as well as providing valuable post-purchase information regarding storage, serving size and preparation. Efficient food labels can serve as a managerial tool in choosing nutritionally healthier food (Grunert & Wills, 2007) and in controlling food allergies

(Voordouw et al., 2009), while expiry dates can help in assessing food safety (Sanlier & Karakus, 2010).

Furthermore, food labels can assist consumers and patients with chronic diseases to adhere to dietary recommendations by providing nutritional information (Rothman et al., 2006). Chronic diseases, allergens and food borne-illnesses as food-related health risks have become key issues for consumers and the food industry. Furthermore, consumers' demand for information on achieving health benefits through food has led to an increased awareness about nutritional information in maintaining health and preventing disease (Whitney & Rolfes, 2008), which emphasizes the important role that food labels may play in consumers' health maintenance.

Varying results have been reported from studies of consumers' opinions on and use of food labels. Some consumers view nutritional label information as credible (Campos, Doxey, & Hammond, 2011), the product to be healthier on the basis of nutritional and health claims made (Svederberg & Wendin, 2011), and the health information provided positively (Bosman, Van der Merwe, Ellis, Jerling, & Badham, 2014). Ali and Kapoor (2009) reported that their respondents were neutral about the value of food label information during purchase decisions. Earlier research on respondents' opinions about the problems they experienced with food labels points to inadequate understanding of nutritional (Singla, 2010) and numeric information (Rothman et al., 2006), or of claims about nutrition and health (Svederberg & Wendin, 2011). Contradictory information (Grunert & Wills, 2007), font size, information that is difficult to detect (Mannell et al., 2006), and the provision of allergen information (Voordouw et al., 2009) also caused problems.

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Consumers' use of food labels depends on the importance attached to label information (Annunziata, Ianuario, & Pascale, 2011). They see food labels as providing useful information, with expiry date, manufacturer and health risks being the most important (Ali & Kapoor, 2009). Respondents have reported using food labels to make nutritional comparisons, plan nutritious meals (Sanlier & Karakus, 2010) or fulfill special dietary needs (Singla, 2010). On the other hand, Mannell et al. (2006) reported that non-use of food labels was attributed to lack of interest in or understanding of the information. Furthermore, consumers sometimes use labels, but do so incorrectly (Rothman et al., 2006), inadequately or not for the intended purpose (Sanlier & Karakus, 2010).

Consumers' thoughts or views that can easily change are referred to in the literature as their opinions (Hornby, 2005), whereas consumers' attitudes indicates an evaluation of objects which is lasting (Solomon, 2011). Consumer opinion might guide or encourage consumer behavior (Bareham, 1995), which implies that consumers' opinions about food labels might also possibly guide their label use. Consumers' opinions are thus a lower level of consumer behavior that are easier to measure than their attitudes which are difficult to change and of a higher level. Research conducted by Misra (2007) modeled the relationship between consumers' nutrition knowledge, nutrition education, attitudes towards food labels and label use. Since the association between consumers' opinions on food labels and label use has not been investigated we attempted to bridge the gap between these two constructs for food labels.

Previous international research relevant to consumers' opinions and use of food labels mostly focused on consumers in urban areas (e.g. Mannell et al., 2006; Singla, 2010), while South African studies were more urban (Bosman et al., 2014) or small-scale (Kempen, Bosman, Bouwer, Klein, & Vander Merwe, 2011). However, none has specifically addressed consumers in more rural or urban–rural hybrid areas. The focus of our study was to investigate the specific food labeling needs of consumers in the North West province of South Africa, as an urban–rural hybrid location having small to medium towns as well as larger towns and cities. Such research might provide valuable insights about food label opinions and use in other developing countries with urban–rural areas, such as Nigeria, Turkey and Mongolia. Our objectives, therefore, were, first, to determine consumers' opinions about food labels as an information source, and problems experienced with and the importance attached to these labels; second, to determine consumers' use of food labels; third, to determine the differences between the opinions on and use of food labels among consumers from different areas within an urban–rural area; and finally, to determine the association between consumers' opinions on and use of food labels using structural equation modeling (SEM).

2. Materials and methods

2.1. Respondents

This cross-sectional survey (N = 912) employed a descriptive research design. In order to be able to answer the questions, respondents had to: 1) be 18 years and older; 2) understand English, since most South African food labels are provided in English; and 3) read food labels. The latter criterion was necessary since consumers not reading labels would not be able to answer the questionnaire.

Trained fieldworkers recruited respondents from areas in the North West Province classified according to population size (CSIR, 2012), that is, small to medium towns (60,000–10,000 inhabitants: Lichtenburg, Wolmaransstad, Vryburg and Zeerust), large towns (100,000–350,000 inhabitants: Potchefstroom and Mafikeng) and large cities (350,000–1,000,000; Klerksdorp and Rustenburg). Convenience sampling took place in public areas such as educational institutions, government service departments, shopping centers and office buildings. Potential

respondents were purposively selected based on their compliance with the inclusion criteria.

2.2. Measuring instrument

A questionnaire was designed, since no existing instrument could be traced that measured consumers' opinions on food labels as an information source, problems with and importance of labels, and their pre- and post-purchase use. The questionnaire was developed by food and consumer science professionals and comprised three sections: Section A – items on opinions about labels as an information source, and problems with and use of food labels employing a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree); section B – types of food information evaluated according to respondents' opinions of their importance on another 5-point Likert scale (1 = not important at all; 5 = very important); and section C – demographic data on respondents. The final questionnaire was scrutinized for content validity by experts in consumer science, psychology and statistics.

2.3. Data collection

A pilot study was conducted prior to the main study in Potchefstroom, using 45 respondents to refine the questionnaire and methodology. Interviewer-administered questionnaires were employed to obtain a better response rate and enable the fieldworker to assist respondents with uncertainties regarding the questionnaire (Babbie, 2010). Data were collected on different days of the week and at different times of the day. The questionnaire took approximately 10–15 min to complete. This study was approved by the Ethics Committee of the North-West University (reference number NWU-00024-09-A1) and all necessary ethical requirements such as informed consent and anonymity were adhered to.

2.4. Data analysis

Descriptive statistics, such as frequencies and percentages were determined. The percentage responses to the 5-point opinion and use scales were combined into corresponding 3-point scales. Cohen's *d*-values were calculated to indicate differences between respondents who disagreed and agreed, as well as between those selecting unimportant and important, where values of 0.3, 0.5 and 0.8 depicted small, medium and large effect sizes, respectively. Only *d* > 0.7 was considered practically significant and reported.

Exploratory principal axis factor analysis with Oblimin rotation was conducted on the original 5-point Likert scale for all opinion items, including label importance items and the items determining respondents' use of food labels. From the extracted factors only those that theoretically made sense were subjected to confirmatory factor analysis (CFA) to determine construct validity. Three statistical indices from three broad classes were used to measure the goodness of the model's fit as recommended by Hancock and Mueller (2010), namely the Chi-square statistic divided by degree of freedom (χ^2 / df), root mean error of approximation (RMSEA) and comparative fit index (CFI). The χ^2 / df was used since χ^2 is sometimes viewed as an overly strict statistic that might detect even insignificant deviances from the proposed model (Hancock & Mueller, 2010).

Internal reliability of the extracted factors was determined through Chronbach's coefficient alpha and mean inter-item correlations. Mean factor scores were calculated from the mean of all the questions contributing to it, so that factor scores could be interpreted on the original 5-point Likert scale. To determine inter-item reliability, cross-tabulations between items similar, or opposite, in meaning were determined, where phi coefficients of 0.1, 0.3 and 0.5 indicated small, medium and large relationships. Only large effect sizes, which indicate practical significance, are reported.

Analysis of variance was done to determine differences between demographic variables and the different mean factor scores. Both *p*-values and *d*-values were calculated, but only the latter reported, to indicate differences important in practice. Cross-tabulations with phi coefficients were used to determine associations of interest between items in the questionnaire.

Structural regression modeling was performed to test the relationship between opinion and use of food labels. The same fit statistics were used as for CFA. Standardized regression weights (β -values) were used to indicate the importance of relationships between factors.

All statistical analysis was done using IBM® SPSS® Version 21, except for CFA and SEM which was done with IBM® SPSS® AMOS 21.0.

3. Results and discussion

3.1. Demographic characteristics of the respondents

Most respondents came from large towns, followed by almost equal numbers from large cities and small to medium towns (Table 1). The higher percentage of female respondents could be attributed to the inclusion criteria of needing to be somewhat responsible for household food purchases and being food label readers, since women generally adhere to these criteria to a greater extent than men (Graham, Orquin, & Visschers, 2012; Misra, 2007). Most respondents belonged to the youngest age group and spoke a Eurocentric language (Afrikaans and English). A few did not have a grade 12 certificate (indicates completion of secondary school), as expected, since respondents had to be label readers and those with less education might have had difficulty in reading food labels correctly (Cowburn & Stockley, 2005; Graham et al., 2012). Most of the respondents were employed, which might explain why most also owned a motor vehicle, so we assumed that most belonged to a middle to higher income group. Although only a few indicated that they lived alone, respondents were almost equally distributed between the groups for marital status.

Table 1
Summary of respondents' demographic data (N = 912).

Variables	N	%
Location		
Small to medium towns	183	20.1
Large towns	520	57.0
Large cities	209	22.9
Gender		
Male	285	33.0
Female	578	67.0
Age		
18–29	608	67.1
30–49	245	27.0
≥50	53	5.8
Language		
Eurocentric	583	66.3
African	296	33.7
Education		
<Grade 12	56	6.5
Grade 12	327	37.7
Tertiary	485	55.8
Employment status		
Employed	609	67.9
Student	194	21.6
Unemployed	94	10.5
Marital status		
Single/widowed/divorced	462	51.4
Married/living together	437	48.6
Share home with		
No-one	135	15.1
Other people	761	84.9
Motor vehicle owner		
Yes	708	77.9
No	201	22.1

3.2. Validity and reliability

The opinions, rated importance of labels and label use scales were subjected to exploratory factor analysis. From it six factors named “Opinions on label information” (OLI), “Opinions on label problems” (OLP), “Opinions on importance of product information” (OIP), “Opinions on importance of origin” (OIO), “Use pre-purchase” (UPRE) and “Use post-purchase” (UPOST) were employed in CFA (depicted in Fig. 1). All items yielded statistically significant ($p < 0.001$) β -values between 0.22 and 0.79 on the factors, which indicated that all the items loaded onto the factors. Most correlations were statistically significant ($p < 0.01$), except for OLP with OIP ($r = 0.04$; $p = 0.33$) and UPRE with OLP ($r = 0.08$; $p = 0.092$). The fit indices for this model were $\chi^2 / df = 3.93$; CFI = 0.83; RMSEA = 0.057 [90% confidence interval (CI) = 0.054–0.059]. The χ^2 / df value was lower than 5, thus indicating a good model fit, while an acceptable CFI value was obtained, since this value should ultimately be above 0.9, as proposed by Mueller (1996). The RMSEA value was below 0.1, which also confirms a good fit (Blunch, 2008). Since two of the three indices used indicated a good fit and the third acceptable, the fit of the model for the factors in the questionnaire was good and thus indicates construct validity.

As shown in Table 2, the Chronbach-alpha values for all factors were larger than 0.70, indicating good internal reliability, except for OLP with an acceptable value of 0.65 (Malhotra & Birks, 2007). The mean inter-item correlations also indicated good internal reliability for these factors. All the items contributed sufficiently to the factor scores, with correlations with the total score larger than 0.3.

Individual items with similar meanings, such as items concerning the consultation of food labels during buying and shopping, respectively, showed good association ($\phi = 0.72$). Similarly, items stating that labels are good sources of information and easy to understand were practically significantly associated ($\phi = 0.63$). Opposite items stating that food labels are difficult and easy to understand, respectively ($\phi = 0.51$), as well those claiming that labels contain sufficient and insufficient information, respectively ($\phi = 0.51$), were also practically significantly associated, confirming the questionnaire's inter-item reliability.

Table 2 also provides the mean values of all factors; means < 2.5 indicated disagreement and means ≥ 3.5 indicated agreement for OLI, OLP, UPRE and UPOST; means < 2.5 showed unimportance, while means ≥ 3.5 indicated importance for OIO and OIP. Values of 2.5 to 3.4 for all factors showed neutral responses.

3.3. Respondents' opinions regarding and use of food labels

Table 3 gives the frequencies of respondents' agreement with the different statements within the OLI, OLP, UPRE and UPOST factors. Practically significantly more respondents agreed than disagreed on the items within OLI, which indicates that their opinions were mostly positive about food labels as information source as confirmed by the mean factor score for OLI (Table 2). This implies that, for these respondents, the manufacturers had reached the intended goal of employing food labels for informational purposes. It confirms that the respondents were content with the information, in contrast with the literature reporting label information to be excessive (Pomeranz, 2011) or insufficient (Svederberg & Wendin, 2011).

No practically significant differences were found between the percentage of respondents who agreed and disagreed on the statements within OLP (Table 3). Therefore, despite respondents' positive opinions about food labels as information source, they did not hold strong positive or negative opinions on these problems, as confirmed by the neutral mean factor score for OLP (Table 2). By contrast, previous research has reported pertinent problems with labels, including lack of understanding, confusion, inappropriate font size, insufficient accuracy of information (Cowburn & Stockley, 2005), lack of credibility (Van der Merwe &

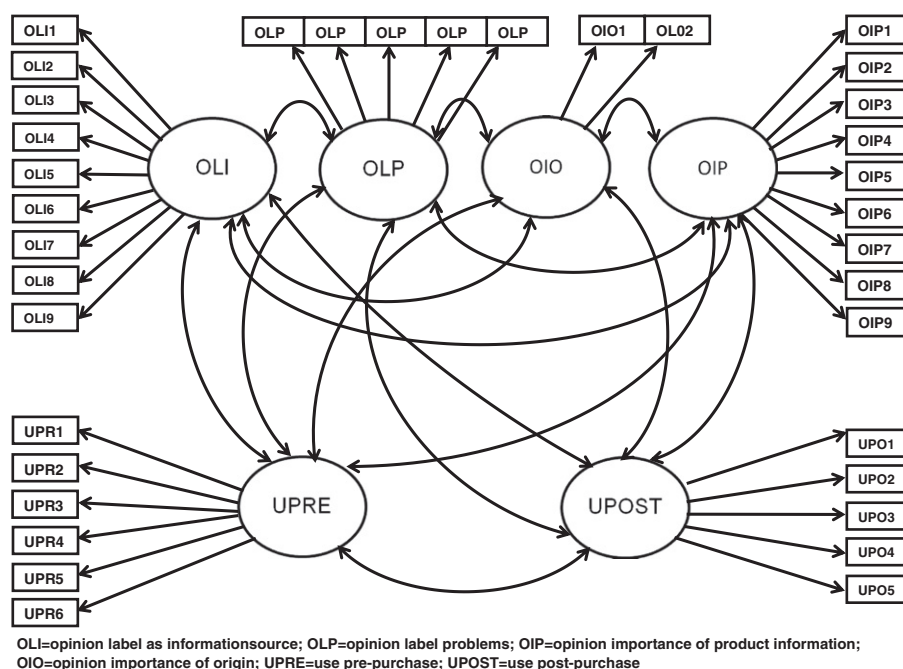


Fig. 1. Confirmatory factory analysis for opinions and use factors.

Venter, 2010) and insufficient information provided to accompany health claims (Svederberg & Wendin, 2011).

Table 4 reveals that, for all the statements of OIP, practically significantly more respondents considered food labels to be important than unimportant. The importance that respondents attached to all product information was confirmed by the high mean factor score for OIP (Table 2), indicating general positive opinions about the importance of product information. Our findings support earlier studies confirming the importance of product information (such as expiry date, nutritional information and ingredient lists) for consumers when they purchase food (Ababio, Adi, & Martin, 2012).

Practically significantly more respondents considered the “Manufacturer name and contact details” in the OIO scale (Table 4) as important than as unimportant and, despite the medium effect size found for their opinions on the importance of “Country-of-origin”, the mean factor score for OIO indicated positive opinions on the importance of information regarding the origin of the product (Table 2). Increasingly globalized food markets cause consumers to be more alarmed about the origin of foods consumed from foreign countries than from their own (Du Plessis & Du Rand, 2012) and they therefore need food label information regarding product origin, and in particular the country-of-origin (Dimara & Skuras, 2005).

Practically significantly more respondents agreed than disagreed with most of the items in UPRE (Table 3), which illustrates the fact that they use food labels during their pre-purchase information searches. Their commitment to use labels pre-purchase was confirmed

by the mean factor score for UPRE (Table 2). Thus, food labels are a valuable source of pre-purchase information (Dimara & Skuras, 2005), since it is often the only available source of information at the point-of-purchase (Cowburn & Stockley, 2005).

For most items within UPOST, no practically significant differences were found between respondents' agreement and disagreement (Table 3), which points to a lack of strong disagreement or agreement on these items. Furthermore, the mean factor score for UPOST showed neutrality on their agreement about using food labels post-purchase. Respondents were thus more certain about their pre- than their post-purchase use, which shows that they mostly employed labels for in-store decisions-making rather than for use at home, and that labels bridge the gap between manufacturers and consumers in-store (Ali & Kapoor, 2009) by providing essential information (Dimara & Skuras, 2005).

3.4. Association and differences between variables and factors

Although there were some statistically significant differences between demographic variables and the opinion and use factors, these differences were not practically significant (d -values < 0.7). This illustrates the fact that the results for the total study sample had a similar pattern over different demographic groups, and no group was exceptional with regard to any specific factor when compared to other groups. It is of specific interest that respondents from small to medium towns, large towns and large cities within this urban–rural hybrid area did not differ

Table 2
Reliability and factor scores included in the confirmatory factor analysis.

Factors	Chronbach α	Mean inter-item correlation	Factor scores mean	SD
Opinions on label information (OLI)	0.75	0.25	3.82	0.58
Opinions on label problems (OLP)	0.65	0.27	2.87	0.76
Opinions importance of product information (OIP)	0.86	0.41	4.25	0.69
Opinions importance of origin (OIO)	0.79	0.65	3.59	1.21
Use pre-purchase (UPRE)	0.75	0.34	3.56	0.79
Use post-purchase (UPOST)	0.73	0.35	3.21	0.84

Table 3

Frequency table for respondents' agreement with the different opinion and use items and factors.

Item no.	Opinion and use factors and items	Consumers (%)			
		Disagree	Undecided	Agree	d-Value ^a
<i>Opinions on label information (OLI)</i>					
OLI1	The label information at the back of the food package is more useful.	13	19	68	1.10
OLI2	I find the written information on food labels to be useful	8	13	79	1.43
OLI3	Food labels serve as a way to sell the product.	11	11	77	1.32
OLI4	A food label is a good source of information.	7	11	82	1.50
OLI5	It is easy to understand the information on food labels.	16	18	65	0.98
OLI6	Labels give me information about the food product.	8	11	81	1.44
OLI7	Labels tell me about the quality of the food product.	15	14	71	1.12
OLI8	Food labels contain sufficient information.	19	25	56	0.73
OLI9	Symbols are a useful source of information on food labels.	16	17	66	1.00
<i>Opinions on label problems (OLP):</i>					
OLP1	Food labels contain insufficient information.	38	29	31	0.15
OLP2	Food label information is difficult to understand.	55	20	25	0.59
OLP3	Information on some food labels confuses me.	31	17	51	0.40
OLP4	I find it difficult to detect the information on the food label.	52	26	22	0.60
OLP5	The print on food labels is too small to read.	40	24	35	0.09
<i>Use pre-purchase (UPRE)</i>					
UPR1	I read labels on food products.	17	13	69	1.04
UPR2	I consult the food label when I buy food products.	21	17	62	0.82
UPR3	I can do without food label information.	61	15	23	0.75
UPR4	I follow the food label information to keep the item fresh for longer.	16	12	72	1.11
UPR5	I consult label information on a product when shopping.	22	12	66	0.88
UPR6	I read all information available on food labels.	39	16	44	0.10
<i>Use post-purchase (UPOST)</i>					
UPO1	I notice when the food label does not include all the necessary information.	31	23	46	0.29
UPO2	I sometimes need information that is not available on the label.	33	18	48	0.30
UPO3	I consult the food label when I prepare the product.	30	16	53	0.47
UPO4	I consult the food label information when I use the product.	24	17	59	0.70
UPO5	I use the information on food labels to plan meals.	44	16	40	0.06

1 = Disagree; 2 = Undecided; 3 = Agree.

^a Cohen's d-values, where $d = 0.3$ (small); $d = 0.5$ (medium); and $d = 0.8$ (large) – d-values ≥ 0.7 were considered to be practically significant.

significantly in their opinions on and use of food labels, probably because the North West Province overall is classified as more rural than urban. Furthermore, they might have had access to the same types of packaged food and thus the same label information in all areas, even though the size and types of retail outlets might have differed between urban and rural areas. Some larger retail outlets have a presence in small towns and are therefore accessible to even the most rural households. Furthermore, respondents were mostly younger and educated (Table 1), which could explain the lack of differences between age and educational groups, although previous research found differences in food label behavior between genders, educational levels (Graham et al., 2012), ages and ethnic groups (Rothman et al., 2006).

Two practically significant associations of interest were found regarding the informative value of food labels. First, most respondents who agreed that labels are good sources of information also agreed that they read these labels (45%; $\phi = 0.51$). Respondents' positive opinions about the usefulness of label information were thus associated with their label-reading behavior. Second, most respondents who strongly agreed that they followed label information to maintain product freshness also strongly agreed that labels provide information about product quality (57%; $\phi = 0.54$). This association confirmed these respondents' use of storage instructions, which emphasizes the value attached to food labels as a medium that assists in preserving product quality (Dimara & Skuras, 2005). These results are important, since

Table 4

Frequency table for respondents' opinions on the importance of food labels.

Item no.	Factors and statements	Consumers (%)			d-Value ^a
		Unimportant	Undecided	Important	
<i>Opinion on importance of product information (OIP)</i>					
OIP1	Preparation instruction	8	5	86	1.56
OIP2	Brand name	13	9	78	1.30
OIP3	Product mass/volume	12	11	77	1.30
OIP4	Nutrition information	8	9	82	1.49
OIP5	Ingredients	10	7	82	1.46
OIP6	Nutrition claim	14	14	70	1.13
OIP7	Health claim	9	9	81	1.44
OIP8	Expiry date	3	3	93	1.80
OIP9	Storage instructions	5	6	88	1.66
<i>Opinion on importance of origin (OIO)</i>					
OIO1	Country-of-origin	29	14	57	0.56
OIO2	Manufacturer name and contact details	21	15	64	0.86

1 = Unimportant; 2 = Undecided; 3 = Important.

^a Cohen's d-values, where $d = 0.3$ (small); $d = 0.5$ (medium); and $d = 0.8$ (large) – d-values ≥ 0.7 were considered to be practically significant.

consumers are constantly searching for quality and value for money, and our study showed that respondents employ labels not only as a signal of quality but also as a means of maintaining high quality.

The practically significant association between respondents who considered label information to be difficult to understand and those claiming that some food label information confuses them ($\phi = 0.61$) was also of special interest. Most respondents who strongly agreed on the difficulty (54%) also agreed about the confusion caused by the information. Previous research indicated that consumers found some technical and numerical information confusing (Cowburn & Stockley, 2005) and difficult to understand (Svederberg & Wendin, 2011), although confusion might also result from information overload (Pomeranz, 2011). Our study adds that the problems of label difficulty and confusion are related.

3.5. Association between opinion and use of food labels using SEM

From the CFA a SEM model was used to determine the association between respondents' opinions about and use of food labels, since it is useful to test the relationship among different consumer-behavior variables (Carrillo, Prado-Gascó, Fiszman, & Varela, 2013; Mitterer-Daltoé, Carrillo, Queiroz, Fiszman, & Varela, 2013). Fig. 2 depicts only the structural part of the proposed model with β -values, since the measuring model was reported with the CFA model. The β -values were determined between all opinion (OLI, OLP, OIP and OIO) and use (UPRE and UPOST) factors, except for between OLP and UPRE, since the latter correlations were not statistically significant with CFA. Three of the β -values between opinion and use factors were not statistically significant ($p > 0.05$), namely OIO with UPOST ($\beta = 0.10$), OIP with UPRE ($\beta = 0.06$) and OIP with UPOST ($\beta = 0.05$); this shows that OIP did not associate significantly with either of the use factors and could be omitted from the final model. The correlations between OLI, OLP, OIP and OIO were comparable to those of the CFA, and therefore not reported. The fit indices for the proposed model were: $\chi^2 / df = 4.07$; CFI = 0.82; RMSEA = 0.058 (90% CI = 0.056–0.060). Both the χ^2 / df value and RMSEA values indicated a good fit, while the CFI value was relatively acceptable, again indicating a good fit for the proposed model.

The structural part of the final model is provided in Fig. 3. All β -values (0.15–0.62) were statistically significant ($p < 0.001$), which confirms that significant associations existed between respondents' opinions about and use of food labels. The association between OLI and UPRE made the largest contribution to the final model ($\beta = 0.74$),

followed by OLI associated with UPOST ($\beta = 0.62$), which indicated that OLI was the most important opinion factor contributing to both the pre- and post-purchase use of labels in our sample. This finding shows that positive opinions about labels as informative source might result in increased label use during pre-purchase decision-making, and supports the suggestion by Prinsloo et al. (2012) that satisfaction with food label information might result in repeat purchases of the product. However, respondents' opinions on labels as information source contributed more to their pre-purchase than to their post-purchase use of labels. The association between OLI and UPOST is nevertheless notable, since former research has mainly focused on the pre-purchase role of food labels (Ali & Kapoor, 2009; Prinsloo et al., 2012), and to a lesser extent on their post-purchase value, although Butkevicienė et al. (2008) emphasize label elements as informing consumers about correct product use. The associations between OIO with UPRE ($\beta = 0.21$) and UPOST ($\beta = 0.15$) made a smaller contribution to the model and OIO thus had a smaller impact on label use than OLI in our sample. As in the proposed model, the fit indices [$\chi^2 / df = 4.63$; CFI = 0.82; RMSEA = 0.060 (90% CI = 0.060–0.066)] once again indicated a good fit for the final model, confirming that respondents' opinions about and use of food labels were indeed associated.

4. Conclusion

This study provides useful insights into food labels as information source during both pre- and post-purchase use, as earlier studies have concentrated mainly on the pre-purchase use. Furthermore, whereas most studies have focused on consumers' label behavior exclusively in urban areas, this study reports on an urban–rural hybrid location. It was particularly interesting, that regardless of the urban–rural nature of our study, respondents from different areas (either more urban or more rural) did not differ regarding their opinions about or use of food labels.

Since food labels are primarily intended as a source of product information, it was encouraging that respondents' positive opinions confirmed manufacturers' and regulators' labeling intentions. Moreover, respondents had positive opinions about the importance of product and origin label information, which suggests that manufacturers should strive to provide both types of information where possible, despite space limitations, especially since country-of-origin plays an increasingly significant role in the food industry. Our results also highlight the important function of food labels in respondents' search for and efforts to

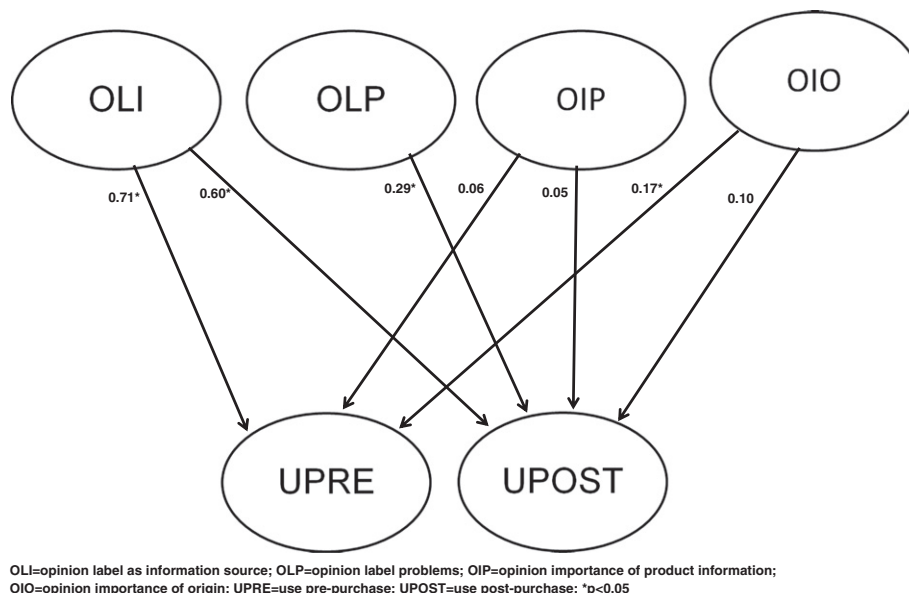
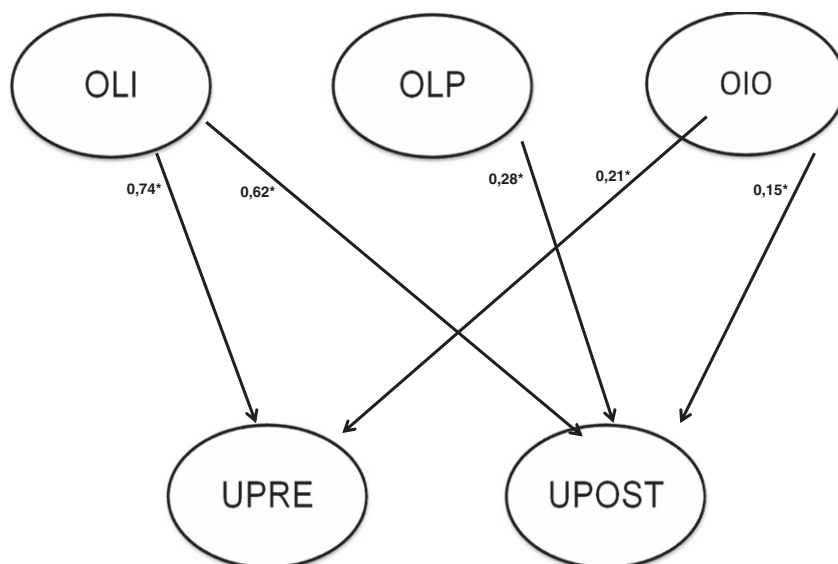


Fig. 2. Proposed model that explains the association between food label opinion and use, with β -values indicated.



OLI=opinion label as information source; OLP=opinion label problems; OIP=opinion importance of product information; OIO=opinion importance of origin; UPRE=use pre-purchase; UPOST=use post-purchase; * $p < 0.05$

Fig. 3. Final model that explains the association between food label opinion and use, with β -values indicated.

preserve product quality. Neutral opinions about label problems emphasized the fact that respondents regarded food labels positively and as having importance, as confirmed by the self-reported pre-purchase use of this information source.

The SEM model is the first to confirm that consumers' food-label opinions could be used to anticipate the intended use of such labels. The model indicates that these respondents' opinions of labels as information source were the most important opinion factor to contribute to both pre- and post-purchase label use, although the greatest impact was at the pre-purchase stage. Thus, it is important for manufacturers to provide information that evokes favorable opinions about this information source, as it can contribute directly to consumers' purchase decisions. Although in general our respondents had favorable opinions about food labels, it is imperative for all consumers to be made aware of the value of the information provided. Understanding this will encourage consumers to use labels during decision-making, thereby looking after their health, getting maximum value for money, and supporting the products that manufacturers provide. Education and awareness campaigns about food labels as a crucial informative source could thus significantly improve consumers' food-label use.

Respondents mostly consisted of younger, more educated consumers, and could be improved by employing probability sampling. Future research could expand the SEM model by incorporating consumers' opinions about other label-related issues, such as the provision of health and nutrition details, and the self-reported use of food labels in our study could also be extended in future studies, using methods such as eye tracking to determine use more objectively. This research offers a valuable first approach to scientists and industry in determining the association between consumers' opinions about and their use of food labels.

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