



## Framing the value and valuing the frame? Algorithms for child safety seat use<sup>☆</sup>



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### ABSTRACT

This study uses both the consumption value and framing theories to examine consumers' choices when making risky decisions. This examination uses a framework of “gives” and “gets” to test the consumer's perception of value and then uses a sequential fsQCA to take the mental accounting of a risky decision. The findings indicate that the value equation provides a beneficial conceptualization of safety that can guide managers and policymakers on ways to connect consumers' perceptions of value with mechanisms that create value-based framing.

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### 1. Introduction

According to the Center for Disease Control (CDC), the leading cause of death for children is a motor vehicle accident National Center for Injury Prevention and Control (NCIPC, 2014). Further, non-fatal motor vehicle accidents injure approximately 165,000 children every year (Romano & Kelley-Baker, 2015). Unfortunately, many of these injuries are preventable and are primarily due to a lack of or incorrect use of child safety seats (Greenspan, Dellinger, & Chen, 2010).

This study combines the consumption value and framing theories to examine consumers' choices when purchasing a safety seat. This examination uses a fuzzy-set qualitative comparative analysis (fsQCA) because more than one causal antecedent is present. The research identifies this condition as a conjunctive cause (working together) that produces the outcome condition of the child safety seat's usage (Ragin, 2000). Further, the research shows that functional, conditional, social, emotional, and epistemic types of values influence the consumer's choice behavior in a give-versus-get framework.

The article proceeds as follows: Section 2 reviews the appropriate literature on the two theories. Section 3 introduces the fsQCA analysis of the child safety seat's usage and the variables of interest. This section also proposes the framework that combines the value equation with

framing and re-analyzes the data. Section 4 offers a discussion, conclusions, and implications.

### 2. Literature review

#### 2.1. Consumption value theory.

This study adapts the theory of consumption value, which comes from economic theory and the concept of utility (Sheth, Newman, & Gross, 1991), to a context in which the use or lack of use of child safety seats exists. The original consumption value theory has three fundamental propositions to explain the choice or use of a product, namely: The use is a function of many consumption values. In any given use situation, the consumption values have differential contributions. And the consumption values are independent. Sheth et al. (1991) suggest that five types of values influence the consumer's choice behavior: functional, conditional, social, emotional, and epistemic. The functional value of a product or service revolves around the physical measurement of its features and their respective benefits. An assessment of the conditional value comes from understanding the situational factors that surround its consumption. Therefore, a scarce product might have an inappropriately high conditional value at a particular moment simply due to its scarcity. The social value centers on the normative environment of the consumer as well as the type of object or service. Thus, products with a high social value allow the consumer to appear as a high-class individual. The emotional value of a product or service involves feelings such as love, fear, and arousal. The epistemic value comes from a desire for knowledge, curiosity, or novelty-seeking (Sheth et al., 1991). From a

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**Table 1**  
Construct items.

Construct	Items
PRICEATT	1. The price of child safety seat is high.
	2. The price of child safety seat is low.
	3. Child safety seats are expensive. (Yoo, Donthu, & Lee, 2000)
RISKAVERCOMBINED	1. I would rather be safe than sorry.
	2. I want to be sure before I purchase anything.
	3. I avoid risky things. (Donthu & Garcia, 1999)
	4. I don't like to take risks.
	5. Compared to most people I know, I like to live life "on the edge."
	6. I have no desire to take unnecessary chances on anything.
	7. Compared to most people I know, I like to gamble on things. (Burton, Lichtenstein, Netemeyer, & Garretson, 1998)
ATT_SS	1. Child safety seats are too expensive to be used.
	2. To prevent injury during a crash it is always safer to use a child safety seat.
	3. It is more convenient for a passenger to hold a child.
	4. Safety seats must be changed as a child grows.
	5. It is important to use a child safety seat for a small duration trip.
	6. To prevent severe injury it is always better to use a safety seat.
PERCEIVEDKNOW	1. I have a lot of experience with child safety seats.
	2. As compared to the average person, I would say that I am highly knowledgeable about the child safety seat product category.
	3. I would describe myself as being very familiar with the child safety seat product category. (Beatty & Smith, 1987)
ATT_OBJECT	1. Child safety seats are a good idea.
	2. Child safety seats are a favorable idea.
	3. Child safety seats are a pleasant idea. (Lord, Lee, & Sauer, 1994)
PRODUCTEXPR	1. I have a great deal of skill in using child safety seats.
	2. I make use of child safety seats frequently.
	3. I have experience using child safety seats.
	4. I know how to operate child safety seats. (Griffin, Babin, & Attaway, 1996)
PRICECONSCIOUS	1. I buy as much as possible at sale prices.
	2. The lower price products are usually my choice.
	3. I look carefully to find the best value for the money. (Shim & Gehrt, 1996)
INTENTIONTOUSE	1. How often do you use a child safety seat while driving with children under the age of 14 years?
	2. How often do you use a child safety seat?
	3. How regularly do you use a child safety seat? (Sirgy et al., 1997)

value equation perspective, the perceived quality is a proxy for a get/benefit, whereas the perceived price is a give/cost. The research sees both as inputs in the perceived value that contributes to customer satisfaction and ultimately to loyalty (Gallarza, Gil-Saura, & Holbrook, 2011).

## 2.2. Framing theory

The concept of framing comes from the study of social movements that allows individuals to construct meaning and interpret occurrences. As such, framing allows events to become meaningful and to lead to experience and eventually to intention or action (Benford & Snow, 2000). In the realm of consumer choice, this theory forms the basis for mental accounting through a value function. This function suggests that individuals weigh pleasure and pain through the reference point of their perceptions and therefore adjust for framing effects. As such, the marketing research applies the framing theory to multiple contexts, for example, prosocial behaviors such as public transportation, recycling (Krishen, Raschke, Kachroo, LaTour, & Verma, 2014), and obesity prevention (Krishen & Bui, 2015). This study contends that when a consumer faces a decision regarding the usage of a child safety seat, he or

she will weigh the sacrifices versus the benefits to derive his or her perception of the value. In so doing, the consumer frames the information as a risk choice that comes from his or her individual predisposition and situational factors.

## 3. fsQCA study

### 3.1. Participants and measures

Using the quota convenience sampling technique of combinatorial optimization-based sample identification (Raschke, Krishen, Kachroo, & Maheshwari, 2013), graduate students collected a non-student sample of 217 respondents. The subjects had to meet the following criteria to participate: (1) be 18 or over; (2) have one or more children under the age of 14; (3) have a valid driver's license in the state of Nevada; and (4) not be enrolled as a student in a university. The study measures all of the constructs, except for the intention to use, with a 7-point Likert scale with a range of 1 = strongly disagree to 7 = strongly agree. The intention to use construct has endpoints of 1 = not often at all to 7 = very often. Table 1 contains the scale details, and Table 2 provides the respondent demographics.

### 3.2. Procedure to apply fsQCA method

Since this survey uses a Likert scale, the fsQCA appropriately captures the degree of agreement of the qualitative statements (Emmenegger, Schraff, & Walter, 2014). The original values for all variables (conditions) are calibrated into membership scores ranging from zero to one. The calibrations are not the most common definition of a variable but instead are essentially represented by the degree of membership of a group of values in a category or specific condition, such as a loyal customer (Woodside & Zhang, 2013).

**Table 2**  
Sample demographics.

Category	Frequency N = 186	Percentage
Gender		
Male	78	41.9%
Female	108	58.1%
Age		
<30	101	54.3%
31–40	85	45.7%
Education level		
High school	65	34.9%
Bachelors	71	38.2%
Graduate	14	7.5%
Other	36	19.4%
Household income		
<\$35,000	63	33.9%
\$35,000–\$65,000	57	30.6%
>\$65,000	29	15.6%
Not answered	37	19.9%
Marital status		
Married	113	60.8%
Widowed	2	1.1%
Divorced	25	13.4%
Single	46	24.7%
Number of children		
1	94	50.5%
2	65	34.9%
3	23	12.4%
4 or more	4	2.2%
Vehicles owned		
1	83	44.6%
2	88	47.3%
3	14	7.5%
4	1	.6%

**Table 3**  
Construct descriptions.

Construct	Reliability	Range of construct score	Threshold for full non membership	Maximum point of ambiguity	Threshold for full membership
PRICEATT	0.74	1–343	7	80	252
RISKAVERCOMBINED	0.81	1–823,543	9072	126,540	705,894
ATT_SS	0.75	1–117,649	5760	86,436	117,649
PERCEIVEDKNOW	0.83	1–343	27	150	343
ATT_OBJECT	0.76	1–343	105	294	343
PRODUCTEXPR	0.70	1–2401	270	1,512	2,401
PRICECONSCIOUS	0.73	1–343	12	90	245
INTENTIONTOUSE	0.89	1–343	2	294	343

3.2.1. Data calibration

After the removal of incomplete data, the final data set consists of 186 respondents. Table 3 depicts the ranges for each construct and the fuzzy-set thresholds. The number of items per construct range from three to seven, as in Table 1. To convert the responses to a fuzzy scale, each item construct is multiplied to obtain a construct score. Next, a score is selected at 0.05 (threshold of full non-membership) that is equal to the multiplicative product score where 8% of the distribution of the product scores are below it. The median product is the 0.5 membership score (maximum point of ambiguity) and the multiplicative product score at 92% of the total product scores as the threshold for full membership (the 0.95 value). Table 3 gives the details of these values for all of the constructs. The next step is to use the fsQCA software to convert these constructs into a fuzzy scale between zero and one (Ragin, Drass, & Davey, 2006).

3.2.2. Estimating complex causal statements (recipes)

The aim of the fsQCA is to come up with sentences that show the causal relations between conditions with respect to others (Schneider

& Wagemann, 2010). The membership score for a case in a complex causal statement is the degree of membership in the intersection of the fuzzy-set simple causal conditions that comprise the statement (Woodside & Zhang, 2013). The research considers such complex chains of causal conditions as recipes (Wu, Yeh, Huan, & Woodside, 2014). The sample is split into two subsamples, the first is a training sample (n = 94) with the second subsample (n = 92) providing validation for the results.

3.2.3. Assessing the derived solutions

Using the fsQCA enables the testing of the fuzzy-set membership in an outcome condition for all possible combinations of the antecedent factors of interest. The consistency indicates the degree of strength of the causal relation between the antecedents and the consequents of the fuzzy statements (Ragin, 2007). To obtain the final solution, the study calculates the consistency scores for all possible complex causal combinations for the outcome variable of interest. The combinations that result in high consistency scores indicate potential pathways for outcome conditions.

**Table 4**  
Complex solutions for seat belt usage intention.

Frequency cutoff: 1.00 Consistency cutoff: 0.802236	Raw coverage	Unique coverage	Consistency
<b>c_riskaver*c_perceivedknow*c_att_object*c_productexpr ~ c_priceconsciou</b>	<b>0.264857</b>	<b>0.006218</b>	<b>0.781857</b>
<b>~c_priceatt*c_att_ss*c_perceivedknow*c_att_object*c_productexpr</b>	<b>0.308502</b>	<b>0.023795</b>	<b>0.840117</b>
<b>c_priceatt*c_riskaver*c_perceivedknow*c_att_object*c_productexpr</b>	<b>0.275619</b>	<b>0.002391</b>	<b>0.855288</b>
~c_priceatt*c_riskaver*c_att_ss*c_perceivedknow ~ c_att_object* c_productexpr	0.116705	0.000000	0.862953
~c_priceatt*c_riskaver*c_att_ss* ~ c_perceivedknow* ~ c_att_object*c_productexpr	0.116824	0.000000	0.825867
<b>~c_priceatt*c_att_ss* ~ c_perceivedknow*c_att_object* ~ c_priceconsciou</b>	<b>0.252541</b>	<b>0.029296</b>	<b>0.859585</b>
~c_riskaver*c_att_ss* ~ c_perceivedknow*c_att_object*c_productexpr ~ c_priceconsciou	0.189406	0.000957	0.846606
~c_priceatt*c_riskaver* ~ c_att_ss* ~ c_perceivedknow*c_att_object*c_priceconsciou	0.142533	0.008490	0.815880
c_priceatt*c_riskaver*c_att_ss* ~ c_perceivedknow*c_att_object* ~ c_productexpr	0.188569	0.008849	0.873685
c_priceatt*c_riskaver* ~ c_att_ss*c_perceivedknow*c_productexpr ~ c_priceconsciou	0.171231	0.001674	0.846336
c_priceatt*c_riskaver*c_att_ss*c_perceivedknow*c_att_object* ~ c_priceconsciou	0.189406	0.001674	0.843900
c_priceatt* ~ c_riskaver*c_att_ss*c_perceivedknow*c_att_object*c_priceconsciou	0.208777	0.018175	0.851707
Solution coverage: 0.720435 Solution consistency: 0.687785			
Overall solution			
Frequency cutoff: 4.00 Consistency cutoff: 0.820137	Raw coverage	Unique coverage	Consistency
~c_price_comb*c_exp_comb* ~ c_riskaver	0.358364	0.122683	0.817289
c_price_comb*c_att_comb* ~ c_riskaver	0.244769	0.043166	0.816514
~c_price_comb*c_att_comb*c_riskaver	0.342820	0.129977	0.795064
c_price_comb*c_exp_comb*c_riskaver	0.224082	0.032405	0.829203
Solution coverage: 0.603731 Solution consistency: 0.770957			
Predictive validity testing			
Training sample (n = 94)		Validity sample (n = 92)	
Overall solution consistency	Overall solution coverage	Overall solution consistency	Overall solution coverage
INTENTIONTOUSE	0.772	0.680	0.728
			0.672

Notes: Analyses' thresholds in training sample for the INTENTIONTOUSE: frequency = 1; consistency = 0.802.

3.3. Results

3.3.1. Common method bias testing

To mitigate for common method bias, this study first controls for the item priming effects by placing the items that measure the behavioral outcome variables toward the end of the survey and including fillers (Baumgartner & Steenkamp, 2001). Second, the study uses Harman’s single-factor test. The result of the unrotated exploratory factor analysis reveals a multiple factor solution with a first factor variance of 19.58%, which is well below what the research suggests as a cutoff level (MacKenzie & Podsakoff, 2012). Thus, common method bias is not an issue for the sample.

3.3.2. Using original calibrated constructs

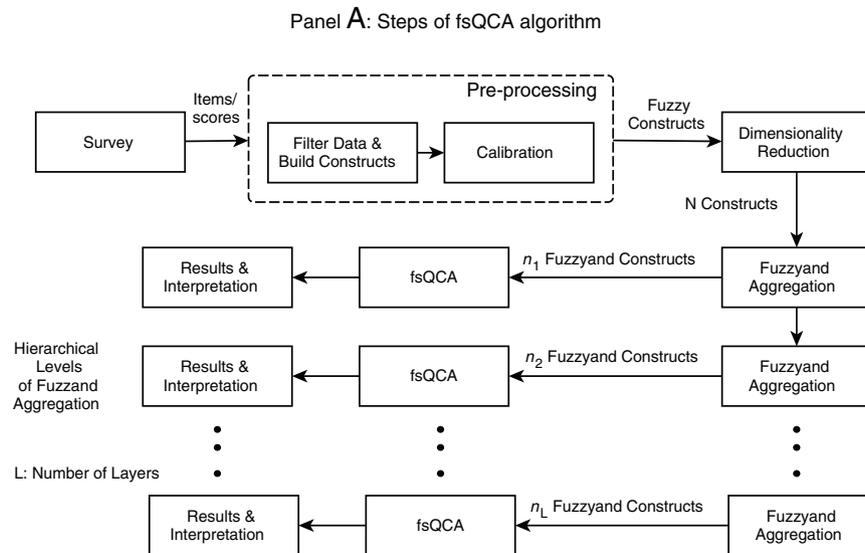
To investigate the outcome construct (*c\_intentiontouse*) in terms of the seven antecedent variables, Table 4 shows the most accurate among the complex, parsimonious, and intermediate solutions. The frequency cutoff is one, and the consistency cutoff is 0.80. The consistency score for the overall solution is low at 0.6877. Although many of the solutions have high individual consistency scores, the raw coverage does not meet the desired coverage values in the range of 0.25 to 0.65 as the

previous research suggests (e.g., Woodside, 2013). Hence, the solutions in Table 4 show the four resulting recipes (highlighted in bold) that meet the desired cutoff for the consistency and the raw coverage.

3.3.3. Using fuzzyand constructs.

Panel A of Fig. 1 shows the calibration process for the items and their scores to create constructs. The fuzzyand constructs go through a dimensionality reduction step in an iterative process. In order to improve the results, this study constructs additional fuzzy constructs as follows: (1) *c\_price\_comb* = fuzzyand (*c\_priceatt*, *c\_priceconscious*), (2) *c\_exp\_comb* = fuzzyand (*c\_perceivedknow*, *c\_productexpr*), and (3) *c\_att\_comb* = fuzzyand (*c\_att\_ss*, *c\_att\_object*). The definitions of these constructs are conceptually as follows: (1) *c\_price\_comb* is the combination of the price attitude and the price consciousness constructs, (2) *c\_exp\_comb* is the combination of the perceived knowledge and product experience constructs, and (3) *c\_att\_comb* is the combination of the attitude toward safety seats and the attitude toward child safety seat objects.

Next, the study investigates the outcome construct, intention to use (*c\_intentiontouse*), in terms of the three fuzzyand variables listed above along with the risk aversion variable *c\_riskaver*. As the bottom portion



Panel B: Plot of *c\_intentiontouse* vs. fuzzy construct combining *c\_perceivedknow* and *c\_productexper*

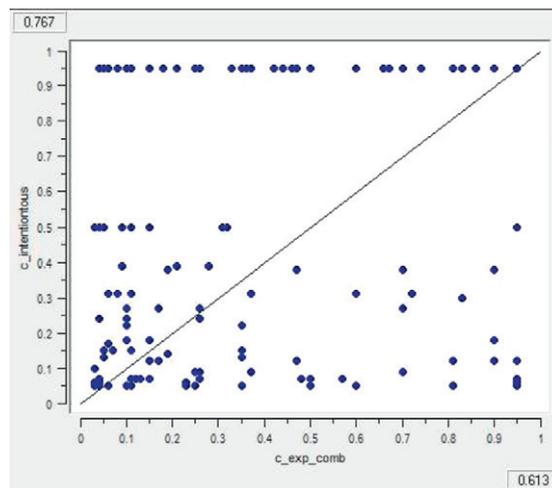


Fig. 1. Algorithm steps and solution plot example.

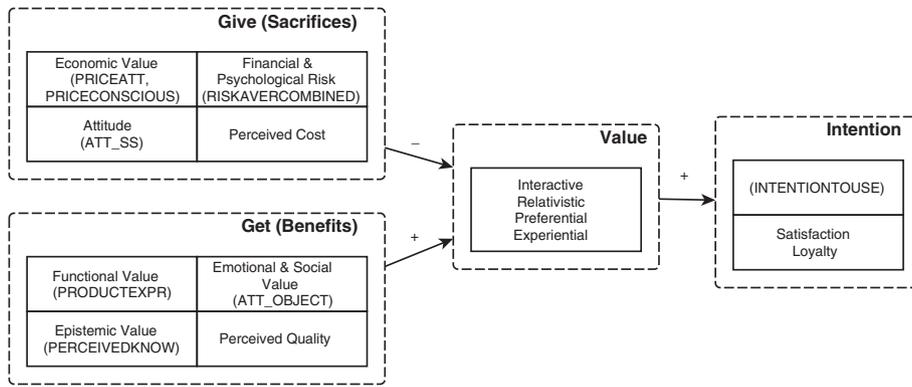


Fig. 2. Consumer framing of the value of safety.

of Table 4 shows, the overall solution has an acceptable consistency of 0.77. This overall solution indicates that all four models (solutions) are informative because all of the consistency values are higher than 0.74, and all of the coverage values are very close to the desired range of between 0.25 and 0.65 (Woodside, 2013).

3.3.4. Testing for predictive validity.

To test for predictive validity, the sample randomly assigns cases to a training subsample (n = 94) and a validation subsample (n = 92). The test then performs a series of fsQCAs to examine the configurations for INTENTIONTOUSE (Wu et al., 2014). Next, the overall solutions from the training sample are tested for their ability to predict the same outcomes as the validation sample. The lower part of Table 4 summarizes the results from these analyses. The results show acceptable consistency and coverage.

4. Discussion, conclusions, and implications

Fig. 2 combines the consumption value and framing theories in a give-versus-get framework to examine the usage intention of a car safety seat. The framing theory and the value equation simplify the complexity of the value to its most basic dichotomy. Fig. 1 shows the basic steps that calibrate the raw itemized survey data to create fuzzy constructs. The study uses these constructs as inputs in the fsQCA software to generate fuzzy sentence results. In order to apply the framing theory, the study performs fuzzyand operations and creates conjunctions of the constructs that lead to aggregated constructs. Then the fsQCA uses these aggregated fuzzyand constructs to get results in terms of the statements that show implications at that aggregated level. This process repeats itself until the process reaches two high-level fuzzyand constructs (dichotomous), as Fig. 3 shows. The findings show that this dichotomous result is quantitatively appropriate. Hence, the overall theoretical framework of Fig. 2 is consistent with the findings in Table 5.

4.1. Consumer value of framing.

Given the value equation and framing theory, this study argues that when consumers face the decision to use a child safety seat, they frame the value of the available information as they form their intention. To form an intention, the consumer uses a give-versus-get framework and forms a perception of the value as an interactive, relativistic, preferential, and experiential entity (Holbrook, 2005). The value proposition of the get encompasses the benefits of using a child safety seat because of the emotional benefit of protecting a child, the epistemic benefit of the experience and knowledge of child safety seats, and the social benefit of abiding by the law in a socially normative way. The costs or the give comprise the attitude relating to the price of child safety seats, price consciousness, and the attitude specifically related to the use or non-use of child safety seats and toward child safety seats in general. Because this study examines the use or non-use of a safety product, the study also includes a risk decision. Thus the study incorporates the individual's behavior of risk aversion to determine whether that behavior makes a causal contribution to the outcome decision. Fig. 2 illustrates the framework that incorporates the fsQCA ideas.

4.2. Instigating consumers to value the frames

Holbrook (2005) argues that customer value is the basis for all marketing strategy and activity. Further, he defines customer value as interactive, relativistic (personal, situational, and comparative), preferential, and experiential. Value is interactive because a transaction between a person and a product or service characterizes value; value is relativistic because value is a perception that can change according to the person who experiences the value. Value is also preferential because value can be measured as an attitude or can lead to satisfaction or loyalty; value is experiential because value can involve hedonic pleasure that comes from the exchange itself and not the product or service being

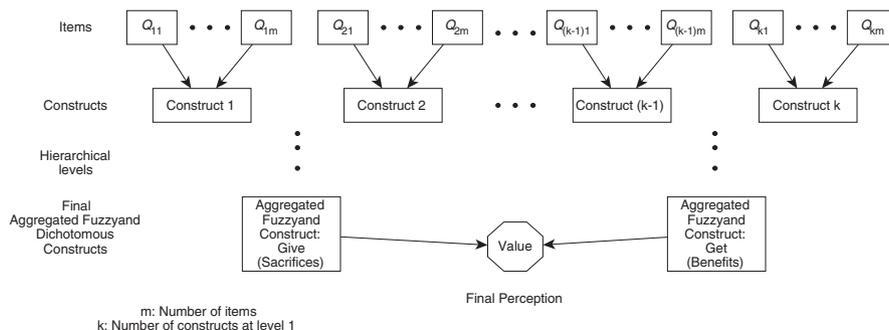


Fig. 3. fsQCA value framing algorithm.

**Table 5**  
Analysis using proposed Fig. 2 framework.

Number of items (Q)	Constructs	New constructs	Type	
3	PRICEATT	Sacrifices	Independent	
3	PRICECONSCIOUS			
7	RISKAVERCOMBINED			
6	ATT_SS	Benefits	Independent	
4	PRODUCTEXPR			
3	ATT_OBJECT			
3	PERCEIVEDKNOW	Dependent	Dependent	
3	INTENTIONTOUSE			
Overall solution				
Frequency cutoff: 35.000000 consistency cutoff: 0.806967		Raw coverage	Unique coverage	Consistency
~Sacrifice × benefits Solution coverage: 0.501375 Solution consistency: 0.806967		0.501375	0.501375	0.806967
Predictive validity testing				
	Training sample (n = 94)	Validity sample (n = 92)		
	Overall solution consistency	Overall solution coverage	Overall solution consistency	Overall solution coverage
INTENTIONTOUSE	0.865	0.568	0.797	0.209

Notes: Analysis thresholds in training sample for the INTENTIONTOUSE: frequency = 3; consistency = 0.780.

exchanged (Holbrook, 2005). Thus, the core proposition is that the valuing of safety does not entail a one-size-fits-all solution. Instead, consumers frame their concept of value because of gives and gets by performing mental accounting. In order to test this framework, this study performs two analyses. The first analysis reduces the dimensions and produces the findings in Table 4. Fig. 2 introduces the framework, and the study re-analyzes the data as a set of dichotomized and oppositional frames (gives and gets, costs and benefits) to derive the consumer's perception of value (Krishen & Homer, 2012). The second analysis follows the procedure in Fig. 3 and results in appropriate and optimal consistency and coverage levels; the study also performs predictive validity testing on this solution, which the bottom portion of Table 5 provides. This aggregated fuzzyand solution with the dichotomous framework of (minimize sacrifices) × (maximize benefits) leads to an overall high value for the consumer.

The present study contributes to the research in multiple ways. First, the analysis shows that policymakers and managers can frame recipes for safety to improve the perception of value and to allow consumers to re-think their conception of cost. For instance, if ample evidence indicates that cost should not be conceptualized as monetary but instead as life (i.e., cost of a child safety seat versus cost of a life), the balance of the framework will lean more heavily toward valuing safety. Secondly, the study introduces a framework for the valuing of safety and analyzes a set of consumer data against this framework to show that the dichotomous accounting of gives and gets can provide a fruitful conceptualization of safety. In this way, the recipes in Fig. 3 allow for the layering of constructs and hierarchical levels of fuzzyands and thus provide a richer asynchronous, analytical technique.

As a limitation to this research and an avenue for future research, the study uses a potentially contextual solution to the safety issues of child seat usage. Future research can study risk and safety in other contexts to further understand whether this conceptualization is product- or context-specific as well as with other methods such as purely qualitative, mixed methods, or quantitative models. The managerial implications of this study's results are very significant. Policy decisions in general have to be made at various levels. For instance, the governor of a state might be making a decision regarding whether to fund an investment project on seat belt safety. For such a big picture decision, the governor could use the highest level result from the fsQCA (meaning the dichotomous findings in Table 4). Conversely, the findings from the fsQCA analysis (Table 3) that uses disaggregated variables might

provide guidance on detailed decisions. Thus, the results indicate that the value equation is a conceptualization of safety that can guide managers and policymakers with ways to connect a consumer's framing of value that produces mechanisms by which to create value-based framing.

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