



# Does poverty promote a different and harmful way of thinking? The links between economic scarcity, concrete construal level and risk behaviors

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## Abstract

We tested the relationships between economic scarcity, concrete construal level and risk behaviors. We manipulated the lack of economic resources using a priming task in Studies 1 and 2, and participants reported their real income and completed the BIF scale to measure their construal level in Study 3. Studies 1–3 supported the link between perceived economic scarcity and the concrete construal level. Study 4 demonstrated the mediating role played by the concrete construal level in the influence of economic scarcity on risk behaviors using two opposite priming procedures (scarcity plus abstraction). Study 5, in a real context of economic vulnerability, supported the link between concrete mindset and risk behavioral intentions, while abstraction was associated with fewer risk intentions. Concrete thinking implies focusing on the immediate situation, which might facilitate adaptation to the demanding conditions that characterize scarcity contexts but leaves people without a broad perspective of the future to make safe decisions in situations that involve self-control, such as health-risk behaviors. Because an abstract construal level can be induced, these findings open up challenging ways to improve the conditions in which people in scarcity contexts make some behavioral decisions while we continue working to reduce situations of economic scarcity.

**Keywords** Economic scarcity · Construal level · Concrete mindset · Risk behaviors

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Numerous statistics show that people with scarce economic resources present more risk behaviors than people with sufficient resources (Adams & White, 2009; Beaglehole et al., 2003; Bertrand et al., 2004). The actions of poor people are frequently found to reinforce their situation of poverty, creating a cycle that is difficult to break. The explanations for this problem point out to both personal (e.g., personality traits) and environmental factors (e.g., less access to health and education resources), and more recently, research shows the influence of scarcity on cognitive processes (see Mani et al., 2013; Shah et al., 2012).

Studies of the influence of scarcity on cognition have revealed how some dimensions of intelligence are affected by the lack of financial resources. Resource scarcity produces a cognitive limitation that makes it more difficult to consider long-term consequences during decision-making (Mani et al., 2013; Shah et al., 2012). Previous authors tested this hypothesis with a real population in India, weeks before and after the harvest, when families are money-conscious. The same individuals obtained worse scores in fluid intelligence when they were momentarily in the situation of economic scarcity (i.e., before the harvest) than in the situation

of greater abundance (i.e., after the harvest). Neither anxiety nor physical effort explained these results (see Mani et al., 2013). In the same vein, Shah et al. (2012) found that people in a situation of scarce resources focused their attention on short-term solutions, although these solutions implied high costs in the long term (for example, they agreed to borrow resources at a very high interest). Thus, the results reveal that people in a situation of low economic resources (versus in a situation of nonscarcity) make decisions that lead to negative final results. In a series of quasi-experiments activating “economic concerns”, Mani et al. (2013) found that people with fewer real economic resources obtained worse results in various intelligence tests than people with greater economic means; importantly, these differences disappeared when economic concerns were not previously activated.

For Mullainathan and Shafir (2013), scarcity changes the way in which information is processed, focusing people’s attention on the short-term situation and minimizing the importance of the long-term consequences of behaviors. Thus, for example, in places where the need for water treatment is crucial, poor people focus on obtaining daily food and fail to attend to the issue of drinking water quality, which generates life-threatening diseases (Banerjee & Duflo, 2011).

In experimental contexts where scarcity is induced, participants report high levels of social anxiety, which determines their high consumption of hypercaloric food (Bratanova et al., 2016). Previous authors explained the effect of experimental scarcity based on the levels of perceived social anxiety, which makes it difficult to adequately assess the consequences of behavioral decisions and leads people to higher calorie consumption. The relationship between low childhood socioeconomic status and eating in the absence of energy needs in adulthood is also explained as a way to promote survival in harsh contexts (Hill et al., 2016). Mittal and Griskevicius (2014), in several experimental studies manipulating the perception of economic uncertainty, found that people with a childhood of scarcity manifested a low sense of control and highly impulsive decision-making. These results are supported by a recent review on the relationship between social class and behavior, where Manstead (2018) found that social classes with fewer economic resources present lower levels of perceived control, attributing their precarious situation to external factors, which reduces their motivation to initiate change strategies. From this perspective, the situation of poverty increases self-control problems and harmful decision-making.

One variable closely related to problems in self-control is the style of thinking. How actions are mentally represented varies between people and contexts (Vallacher & Wegner, 1989). Action identification theory (AIT, Vallacher & Wegner, 1989) points out that the high difficulty of an action determines that individuals attend to how to perform the

behavior; the result is a concrete mental representation focused on the details and means to overcome difficulties. However, when an action is easy, people can orient toward the final goals involved in the behavior, which characterizes abstract mental representations.

Drawing on this approach, construal level theory (CLT, Trope & Liberman, 2003) explains the differences in style of thinking as a function of psychological distance (temporal, social, spatial or hypothetical) with the events and behaviors represented. CLT proposes a bidirectional relationship between construal level and psychological distance so that, at more distance, mental representations become more abstract, and correspondingly, greater abstraction in the conceptualization of an object or event enables greater psychological distancing from it (Liberman et al., 2007; Trope & Liberman, 2003). Individuals’ construal level is located at some point in a bipolar dimension where one extreme is characterized by thinking concretely and the opposite extreme is characterized by thinking abstractly. What is more relevant psychosocially is that for both theories, AIT and CLT, although it is possible to evaluate the style of thinking as a personal disposition, in both theories, it is admitted that the construal level can be changed due to contextual influence, which opens a way to intervention.

Concrete construal level has been associated with self-control problems because it focuses people’s attention on short-term consequences, favoring behaviors that are pleasant in the short term and harmful in the long term (Fujita, 2008, 2011; Fujita & Carnevale, 2012; Fujita & Han, 2009). In general, healthy behaviors tend to imply difficulties and costs in the present and benefits in the future; in contrast, risk behaviors are tempting in the present and harmful in the future. Under an abstract style, individuals prioritize future benefits over immediate costs, something that is directly related to self-control, a self-regulation strategy that specifically implies acting to achieve distal goals (Fujita, 2008, 2011; Fujita & Carnevale, 2012). Based on CLT, Fujita and collaborators proposed that an abstract construal facilitates greater self-control by focusing people’s attention on the final goals and thus favors healthier and beneficial long-term choices (Belding et al., 2015; Ledgerwood et al., 2010; Libby et al., 2007; Fujita, 2008; Fujita & Han, 2009). A recent study in Nicaragua found that adolescents under severe scarcity who presented a concrete style of thinking reported the highest rates of past and future risk behaviors (Aguilar et al., 2020).

In the present research, we connect all these previous results on scarcity, construal level and self-control. We propose that when people must face numerous obstacles in their daily lives due to their lack of economic resources, they have to focus on the present to overcome immediate problems, a concrete mindset that reduces their self-control when making health-risk decisions. We expect

people to think more concretely under economic scarcity (real or induced) than in nonscarcity situations, and this concrete cognitive style in turn will promote more risk behaviors. Because an abstract construal level is associated with higher self-control and healthier behavioral decisions (see Fujita, 2008; Fujita & Han, 2009), we expect that people who are induced to think abstractly, even under scarcity conditions, will present lower risk behaviors than individuals with a concrete style in the same low resource situation. We note that a concrete construal level is not inherently bad or good; it depends on the context and behavior. Presenting a concrete construal level to deal with difficulties in a context of economic scarcity may be an appropriate strategy in some situations. In some everyday problems, a concrete short-term focus is the best way to survive, for instance, to share a house with family members to have a shelter until you get a better place. However, when self-control is necessary, such as in health-risk behaviors, a concrete mindset increases unhealthy decisions, while an abstract mindset promotes long-term healthy actions. In the present research, we focus on these health-risk behaviors, where an abstract mindset facilitates making decisions with healthier long-term consequences. Logically, we will only explore behaviors that people can freely choose (e.g., snacking or not snacking, drinking or not alcohol).

Studies 1–2 test how inducing the subjective experience of scarcity (i.e., perceived economic scarcity) promotes a more concrete style of thinking. Study 3 supports the economic scarcity-concrete construal level link by measuring (not manipulating) the participants' personal economic level and their cognitive style. Study 4 tests how economic scarcity promotes more risky decisions and how an induced abstract style of thinking can reverse this effect, reducing the likelihood of making unhealthy decisions. Finally, in a real context of economic vulnerability, Study 5 analyzes the combined influence of construal level and economic scarcity on some health-risk behavioral intentions.

In the present studies, the sample size is in line with that of previous studies testing the effects of economic scarcity on unhealthy behaviors, such as snack intake. These studies obtained a medium effect size  $f=0.30$  (see Bratanova et al., 2016; Laran & Salerno, 2013). G\*power calculated for ANOVAs indicates that we need a sample size of  $N=90$  participants (two conditions) and  $N=126$  participants (four conditions) to reach at least a power of 80% (alpha of 0.05). When we compared binary choices with *Chi-squared tests*, the sample size suggested was  $N=122$  participants. We organized laboratory experiments for full two weeks during which the laboratory cubicles were available; after collecting the sample size suggested by G\*power, we continued all the sessions to complete the schedule offered to students. The sample in Study 3 was the result of the response to

voluntarily participate given by the students of a psychology course at the university as part of a broader survey. All measures, manipulations, and exclusions in the studies are disclosed.

## Study 1: Manipulated Economic Scarcity and Construal Level

In the first study, we tested the influence of perceived economic scarcity on construal level. When people are living in a situation of economic scarcity, they face numerous challenges and difficulties daily. To survive in these contexts, people need to focus on immediate demands. For this reason, we expected that participants in the scarcity condition (induced by an experimental manipulation) would change their mindset to a more concrete construal level to attend to the urgent situations caused by their low economic level. However, participants in the control condition (without any manipulation activating economic problems) would answer the questions under their personal construal level, which would mostly be abstract (see Huntsinger et al., 2014). In this study, we used an adaptation of the Bimboola paradigm (Jetten et al., 2015) to manipulate the experience of economic scarcity. To measure construal level, we followed the procedure tested by Rim et al. (2013), asking participants to generate the causes and effects of several events. Rim and colleagues found that people under a concrete mindset perceived that they could generate effects more easily than causes; however, the ease of generating causes was perceived equally at both construal levels (Rim et al., 2013, Experiment 2). Thus, we expected that participants in the scarcity condition would perceive generating consequences to be easier than generating causes. We did not expect to observe differences in cause generation.

## Method

### Participants

A total of 131 undergraduate students (126 women) voluntarily participated, with a mean age of 18.44 years ( $SD=0.61$ ). They were randomly assigned to the experimental and control conditions: 63 in the scarcity condition and 68 in the control condition.

### Procedure and Measures

In separate cubicles, participants completed an online survey designed with Qualtrics software. After agreeing to participate in the experiment in exchange for course credit, they were invited to imagine themselves living in a new society called “Bimboola”, a society with different economic

classes. Society was organized into five income groups: the wealthiest group earned more than 100,000 Bimboolean € per month; the second group earned between 10,000 and 100,000 Bimboolean € per month; the third group earned between 1000 and 10,000 Bimboolean € per month; the fourth group earned between 400 and 1000 Bimboolean € per month; and the fifth poorest group earned less than 400 Bimboolean € per month (on the poverty line). Participants in the scarcity condition were assigned to the fifth group. After receiving this general information about the incomes of each group, participants had to select different items to start their life in Bimboola, such as a house, a vehicle, a phone, and a leisure activity. Photos of three items for each category were presented in each income group, and the offer was appropriate to the economic level. Participants had to choose one of the alternatives offered for their specific group; in this study, they were always the poorest group, and importantly, they could not choose items associated with other groups. The house, the vehicle, the phone, and the leisure activity offered were very unappealing and unattractive to the participants in the scarcity condition. In addition, when making their choice, participants saw the other better alternatives offered to the wealthier groups. After their selection, participants completed three manipulation check items: “In Bimboola, my group is poor”, “In Bimboola, my group is rich” on a 7-point scale (1 = *strongly disagree*; 7 = *strongly agree*) and finally, a question about their group’s monthly income. In the control condition, participants directly answered questions designed to measure their construal level.

To measure construal level, we adapted the procedure used by Rim et al. (2013). Participants were presented with five events (tooth cavity, getting a compliment, fatigue, happiness, and thirst), and they had to generate either as many causes or as many consequences as they could think of. The order of the two blocks of causes and consequences was randomized by Qualtrics; all participants completed both tasks for the five events. This task was introduced with an example:

For causes: if the event is “getting a sunburn”, you might write down “overexposure to sunlight” as one of the causes of this event occurring because “overexposure to sunlight” is a cause of “getting a sunburn”.

For consequences, if the event is “lying in the sun”, you might write down “getting a sunburn” as one of the effects of this event occurring because “getting a sunburn” is a consequence of “lying in the sun”.

Participants were instructed to generate as many as they could “naturally come up with” without being repetitious or worrying about spelling errors. The events were presented one after the other on separate screens with enough space

to write the responses. After finishing the first block of five events (causes or effects), participants answered how much effort it took to generate the causes or consequences on a 5-point scale (1 = *no effort*; 5 = *a lot of effort*). The same scale was placed after the second block of causes or consequences depending on random order. Finally, they reported demographic information (i.e., age and gender).

## Results

First, we analyzed the manipulation check items to exclude participants who had not understood the instructions or did not correctly remember their economic group. We also analyzed the causes and consequences generated to verify that the task was done correctly. All participants completed the task adequately. The participants in the experimental condition agreed that their group was poor ( $M = 6.19$ ,  $SD = 1.63$ ) rather than rich ( $M = 1.30$ ,  $SD = 0.96$ ),  $t = 16.71$ ,  $p < .001$ .

We conducted a mixed ANOVA with repeated measures on the generation task (causes vs. consequences) and a between-subjects on scarcity manipulation (scarcity vs. control). The results revealed a main effect of the generation task,  $F(1, 129) = 6.07$ ,  $p = .015$ ,  $\eta^2 = .045$ , people perceived that cause generation required less effort than consequence generation ( $M_{causes} = 2.90$ ,  $SD = 0.97$  vs.  $M_{consequences} = 3.12$ ,  $SD = 0.89$ ). The economic condition and the interaction were not significant  $ps > .08$ .

To better interpret the results, we conducted ANOVAs to compare the scarcity and control conditions in terms of the perceived effort in each type of generation task. Regarding causes, the result was not significant ( $M_{scarcity} = 2.84$ ,  $SD = 1.00$  vs.  $M_{control} = 2.96$ ,  $SD = 0.94$ ),  $F(1, 129) = 0.457$ ,  $p = .50$ . However, when participants had to generate consequences, they perceived less effort in the scarcity condition than in the control condition ( $M_{scarcity} = 2.94$ ,  $SD = 0.88$  vs.  $M_{control} = 3.29$ ,  $SD = 0.89$ ),  $F(1, 129) = 5.4$ ,  $p = .02$ ,  $\eta^2 = .04$ .

## Discussion

Rim et al. (2013) found that people with a concrete mindset perceived less effort when generating consequences. Although the interaction was not significant, the partial results show that the participants in the scarcity condition generated consequences with less effort than the participants in the control condition, supporting that economic scarcity promoted a more concrete construal level in our participants. Causes are easier to think of (Rim et al., 2013), as indicated by our results. When people have to deal with difficult conditions, such as living with too few resources, they focus more on immediate consequences than on causes, which means thinking with a more concrete style. The concrete mindset leads people to attend to difficulties in the present. This short-term perspective helps them solve immediate problems

but decreases their attention to the future, something that promotes risky behaviors that offer immediate rewards and long-term costs.

All participants were undergraduate students, who tend to be in the middle or high economic classes, but we do not know the actual economic situation of the students in the control condition. To better test the effect found, in the second study, we decided to manipulate and compare two economic conditions: scarcity and nonscarcity.

## Manipulated Economic Scarcity and Construal Level

Study 2 also explored the influence of economic scarcity on construal level by manipulating two economic conditions: scarcity and nonscarcity (economic sufficiency). To induce each economic level, we used an adaptation of the Bimboola procedure described in Study 1. In this study, participants could be in the scarcity condition with difficulty living comfortably or in the nonscarcity condition with enough money to live comfortably. To evaluate changes in participants' construal level before and after the economic manipulation, we used the Behavioral Identification Form (BIF; Vallacher & Wegner, 1989). This scale is one of the most widely accepted procedures to measure construal level (see Burgoon et al., 2013).

## Method

### Participants

One hundred and twenty undergraduate students voluntarily participated (102 women), with a mean age of 19.05 years ( $SD = 1.48$ ). They were randomly assigned to the scarcity condition ( $N = 61$ ) and the nonscarcity condition ( $N = 59$ ).

### Procedure and Measures

Participants responded to the online survey in separate cubicles. First, they completed twelve items randomly chosen from the BIF (Vallacher & Wegner, 1989). The original version of the BIF (Vallacher & Wegner, 1989) includes 25 items. In this scale, participants are presented with different actions and must choose between two options for each action. One option describes the action in concrete terms, while the other option describes the action in abstract terms. For example, participants must choose whether “locking a door” is best described as “securing the house” (abstract level; scored as 1) or “putting the key in the lock” (concrete level; scored as 0). The number of abstract descriptions selected serves as a measure of abstraction: higher scores indicate higher abstraction. Then, participants imagined

themselves living in Bimboola. The same manipulation used in Study 1 was adopted, with a slight variation in the amounts of money: the wealthiest group earned more than 100,000 Bimboolan € per month; the second group earned between 3001 and 100,000 Bimboolan € per month; the third group earned between 1201 and 3000 Bimboolan € per month; the fourth group earned between 400 and 1200 Bimboolan € per month; and the fifth group earned less than 400 Bimboolan € per month (on the poverty line). The procedure was identical to that in Study 1; participants had to choose a house, a vehicle, a phone, and a leisure activity from a group of three items associated with each economic group. Participants observed the items of all groups when making the selection. The participants in the scarcity condition were assigned to the fifth group (on the poverty line); the participants in the nonscarcity condition were assigned to the third group (enough money to live comfortably).

After the Bimboola manipulation, participants completed the second part of the BIF scale, with twelve new items (only one randomly selected item from the original scale was not used). Finally, they provided demographic information and responded to the three manipulation check items used in Study 1.

## Results

The manipulation checks showed that the participants correctly remembered the amount of money that their social group earned per month. The participants in the scarcity condition evaluated their group as being poorer than the participants in the nonscarcity condition did ( $M_{scarcity} = 6.69$ ,  $SD = 0.77$ ;  $M_{nonscarcity} = 2.05$ ,  $SD = 1.18$ ),  $F(1, 118) = 656.58$ ,  $p < .001$ ,  $\eta_p^2 = .85$ ,  $f = 2.38$ . Consistent with this evaluation, the participants in the scarcity condition considered that their group was less rich than did the participants in the nonscarcity condition ( $M_{scarcity} = 1.10$ ,  $SD = 0.35$ ;  $M_{nonscarcity} = 3.51$ ,  $SD = 1.41$ ),  $F(1, 118) = 168.28$ ,  $p < .001$ ,  $\eta_p^2 = .59$ ,  $f = 1.2$ . The Bimboola manipulation correctly generated the expected subjective perceptions of scarcity and nonscarcity.

An ANOVA using pre-post BIF scores as a within-subject factor (BIF-pre vs. BIF-post) and the Bimboola condition (scarcity vs. nonscarcity) as a between-subject factor revealed a significant interaction,  $F(1, 118) = 13.18$ ,  $p < .001$ ,  $\eta_p^2 = .10$ ,  $f = 0.33$ . The main effects were not significant,  $ps > .32$ . After scarcity induction, the participants showed a lower abstract construal level, while the participants in the nonscarcity condition reported a higher abstraction.

Before the manipulation, all participants showed similar construal level (see Table 1). This result supports that the effect found after the Bimboola manipulation was caused by the economic manipulation and not by individual differences.



**Table 1** Means (SDs) before and after the economic manipulation

Condition	BIF-pre M (SD)	BIF-post M (SD)
Scarcity	7, 57 (2,02)	6,90 (2,26)
Nonscarcity	7,28 (2,42)	7,91 (2,09)

When analyzing the construal level after the Bimboola manipulation, controlling the construal level shown before the economic manipulation as a covariate, the results indicated that the participants under the scarcity condition presented a more concrete construal level than the participants in the nonscarcity condition ( $M_{scarcity} = 6.90$ ,  $SD = 2.26$  vs  $M_{nonscarcity} = 7.91$ ,  $SD = 2.09$ ),  $F(2, 117) = 13.72$ ,  $p < .001$ ,  $\eta^2 = .10$ ,  $f = .34$ .

## Discussion

Study 2 supported that people under the condition of economic scarcity tend to think in a more concrete way than they do when their economic level is sufficient to live comfortably. When people have to face economic difficulties, even in simulated situations, their construal level changes toward a more concrete style. This result was obtained using the most commonly accepted scale to measure construal level, the BIF scale (see Burgoon et al., 2013).

## Study 3: Self-Reported Economic Scarcity in a Real Context and Construal Level

In Studies 1 and 2, we explored the influence of economic scarcity on construal levels by manipulating the economic level with experimental prime. In Study 3, we replicated this analysis considering real economic incomes reported by the participants. Participants' construal level was measured with the Behavioral Identification Form, BIF scale (Vallacher & Wegner, 1989).

## Method

### Participants

In this study, 1175 undergraduate students voluntarily participated (697 women), with a mean age of 25.94 years ( $SD = 9.87$ ).

### Procedure and Measures

The participants responded to an online survey designed in Qualtrics. Students received academic credit for their participation. In the present study, we use only some data collected from the whole survey, which included several

**Table 2** Means (SDs) of the construal level (BIF scores) for each economic level (monthly income)

Economic level	BIF score	N
1 600 € or less	14,00 (4,94)	51
2 From 601 to 1800 €	16,03 (4,71)	320
3 From 1801 to 3000 €	15,27 (4,88)	420
4 From 3001 to 5000 €	15,70 (4,89)	303
5 More than 5000 €	15,69 (5,57)	81

different scales (fatalism and well-being). For our proposal, we considered the answers to the BIF (25 items designed by Vallacher & Wegner, 1989). Respondents also answered an economic level scale (*Approximately what is the monthly economic income of your family unit, considering all income*) with five levels: 600 € or less, 601 to 1800 €, 1801 to 3000 €, 3001 to 5000 € and more than 5000 €. This scale was made considering the interprofessional minimum wage in the participants' country. Finally, they provided demographic information.

## Results

Table 2 shows the sample distribution according to economic level. As expected, most of the participants were in the middle levels of the distribution, while the groups at both extremes presented the lowest sizes.

An ANOVA was carried out on construal level (BIF scores) using the economic level as a between-subject variable. Levene's test showed that although the sample sizes were very different, their variances were similar ( $F(4, 1170) = 1.11$ ,  $p = .35$ ). The results showed a significant effect of economic income on construal level,  $F(4, 1170) = 2.52$ ,  $p = .04$ ,  $\eta_p^2 = .009$ ,  $f = 0.010$ . The participants with the lowest monthly income showed the lowest construal level, that is, the most concrete style of thinking. Waller-Duncan post hoc tests indicated that the participants at the lowest economic level differed from the participants in the other groups, except for the third group (income from 1801 to 3000 €). This third group did not differ from any of the other groups, regardless of whether they had lower or higher economic levels.

Because our hypothesis focuses on the construal level in scarcity situations, we calculated planned comparisons (1 versus 4) to check whether the poorest group (in the scarcity situation) differed from the other groups as a whole (in the nonscarcity conditions). The analysis showed that the group suffering scarcity presented the most concrete style at a significant level, that is, the lowest construal level,  $t(1170) = 2.37$ ,  $p = 0.02$ .

## Discussion

Study 3 clearly indicates that people suffering economic scarcity show a more concrete construal level than people who have enough income to live comfortably. Studies 1 and 2 found this result by manipulating the perception of economic scarcity with experimental prime. More important for our proposal, Study 3 supported the link between economic scarcity and the concrete construal level using the participants' real economic situation. In Study 4, we explore how the link between scarcity and the concrete style of thinking promotes a greater willingness to engage in risk behaviors.

## Study 4: Economic Scarcity, Construal Level and Risk Behaviors

Study 4 examines how the link between economic scarcity and concrete construal level influences risk behaviors that demand self-control. A self-control dilemma implies choosing between the healthy option that is healthy in the long term but unappetizing in the short term (e.g., snacking on carrots) or the option that has negative health effects in the distant future but is desirable in the present moment (e.g., snacking on chocolate). Previous research on construal level has shown that an abstract (versus concrete) construal level promotes self-control (see Belding et al., 2015; Fujita, 2008) and consistently healthier behaviors (e.g., Fujita & Han, 2009). An abstract construal level focuses people's attention on the distant future, while a concrete construal level focuses their attention on the immediate circumstances, making it more difficult for them to resist temptations.

The findings of Studies 1–3 indicated that economic scarcity (manipulated and measured) promoted a concrete construal level. Drawing on these results, we first expected that the participants in the scarcity condition would adopt a more concrete style of thinking and second that this concrete mindset would favor unhealthy decisions. To test both links, we followed the two consecutive opposite primes strategy used by Gardner et al. (2014, Study 3). If poverty leads people to choose unhealthy behavioral intentions because scarcity promotes a concrete construal level associated with low self-control, then priming people in economic scarcity with an abstract construal level should moderate that effect, reducing unhealthy decisions. To examine this mediation, in Study 4, we first induced perceived scarcity in the participants, expecting that this first priming would promote a concrete construal level. After the poverty manipulation, the participants completed a second cognitive priming task to direct their construal level toward a more abstract style. Finally, several risk behaviors and behavioral intentions were measured. The first manipulation induced perceived economic scarcity versus noneconomic prime (control). The

second manipulation promoted an abstract construal level or nonconstrual prime (control). Thus, we had four conditions: a) a condition with only scarcity prime, b) a condition with two consecutive opposite priming manipulations (scarcity and abstraction), c) a condition with only abstract prime and d) a condition without any manipulation.

We expected to observe relevant differences between the first and the other conditions (1 vs. 3 pattern), a result that would show that scarcity promotes a concrete construal level and that this style increases unhealthy behavioral intentions. We did not expect to find differences between the c and d conditions because by default, the abstract construal level prevails (see Huntsinger et al., 2014).

## Method

### Participants

One hundred seventy-four undergraduate students voluntarily participated (153 women), with an average age of 20.13 ( $SD = 3.9$ ). They were randomly assigned to experimental conditions: 41 (only scarcity manipulation), 47 (only abstract prime), 40 (scarcity manipulation followed by the abstract prime) and 46 (no manipulation).

### Procedure

Participants answered the survey privately in individual cubicles. The questionnaire included the manipulations. After voluntarily agreeing to participate, participants received the corresponding manipulation depending on the condition: a) only scarcity manipulation, b) only abstract prime, c) scarcity manipulation followed by abstract prime and d) no manipulations (control). To induce economic scarcity, we followed the same Bimboola procedure used in the previous studies (participants had to imagine living in the fifth poorest group). The abstract construal level was induced with a prime designed originally by Freitas et al. (2004) and modified by Sweeney and Freitas (2014). In this cognitive prime, participants had to complete a two-part prime task. First, they were asked to consider “why” they would maintain good personal relationships, and the four questions were illustrated by diagrams of vertically aligned boxes connected by arrows. Then, eight behaviors selected from Vallacher and Wegner's scale (BIF, 1989) were presented to the participants, and they had to reframe the actions in terms of why the behaviors were performed. When the scarcity and abstraction manipulations were presented sequentially, the scarcity manipulation was always presented first.

After the manipulations, actual risk behavior was measured following the same task used by Fujita and Han (2009): participants had to report their current preferences for a healthy snack (an apple) or an unhealthy snack (a donut) in

a binary forced-choice format. They were asked, “Right now, if you had to choose between an apple versus a donut, which would you choose?” After answering the question, they were instructed to open an envelope and select the corresponding ticket for their snack; this bonus was exchangeable in the cafeteria for a real snack. To measure behavioral intentions on risk behaviors, participants had to report the extent to which they intended to snack on sugary products in the form of soft drinks or sweet candies on a 7-point scale ranging from 1 (*not at all*) to 7 (*very much*). Finally, participants answered the Simulated Drinking Behavior Scale (SDBS) designed and tested by Carrera et al. (2014) to measure the behavioral intention to drink alcohol at a party where alcohol was free and they could choose how much to drink. On the scale, they reported how much alcohol they would have on a drawing simulating a glass (no ice) provided with six marks indicating a range from 5 to 30 cl and how many such drinks they would drink at the party (see details in Carrera et al., 2014). Thus, we measured current behavior with snack selection and used two formats to evaluate behavioral intentions (a scale and a simulated action). Finally, the participants answered several questions about possible food allergies, diet, a control check about how hungry they were at the time on a 7-point scale (ranging from *not at all* to *very much*) and demographics. All the data were collected from 10:00 am to 12:00 am to maintain a constant feeling of hunger.

## Results

Because food allergies or being on diet could clearly bias the results, we excluded twenty-seven participants who reported one or both characteristics. The final sample was  $N = 147$  (129 women), and the distribution across conditions was 37 in the scarcity condition, 38 in the abstract condition, 35 in the scarcity and abstraction condition and 37 in the condition with no primes. We also calculated an ANOVA to ensure that there were no differences between conditions regarding how hungry the participants were, which was supported by the results,  $F(3, 143) = 1.45$ ,  $p = .23$ . All the participants reported a low level of hunger ( $M = 3.46$ ,  $SD = 1.73$ ).

### Current Behavior on Snacking Selection (Apple Versus Donut)

A Chi-squared test showed significant differences between conditions,  $\chi^2(3) = 8.62$ ,  $p = .03$  (see frequencies in Table 3). As we expected, 59.5% of participants in the scarcity condition chose the unhealthy snack; however, in the other conditions, the healthy snack was equally preferred.

Table 3 shows that the relevant difference between conditions concerned the scarcity condition, where participants preferred the unhealthy snack. It is worth noting that when scarcity induction was followed with abstract prime, the

**Table 3** Frequency of snack type choice by condition

Condition	Apple	Donut	N
Control	25 <sub>a</sub>	12 <sub>a</sub>	37
Scarcity + Abstraction	25 <sub>a</sub>	10 <sub>a</sub>	35
Abstraction	23 <sub>a</sub>	15 <sub>a</sub>	38
Scarcity	15 <sub>a</sub>	22 <sub>b</sub>	37

Frequencies in the same column that do not share the same subscripts differ at  $p < .05$  (Z tests, Bonferroni correction)

**Table 4** Means (SDs) on sugary products behavioral intentions

Condition	Mean (SD)
Control	2.70 (1.52) <sub>a</sub>
Abstraction	2.50 (1.35) <sub>a</sub>
Scarcity+ Abstraction	2.49 (1.29) <sub>a</sub>
Scarcity	3.38 (1.40) <sub>b</sub>

Means in the same column that do not share the same subscripts differ at  $p < .05$

participants presented the same behaviors as the participants without scarcity induction (control and abstract condition).

### Behavioral Intentions Regarding Snacking on Sugary Products and Drinking Alcohol

An ANOVA on snacking behavioral intentions between conditions showed significant differences,  $F(3, 143) = 3.33$ ,  $p = .02$ ,  $\eta^2 = .065$ . Post hoc differences revealed that the participants in the scarcity condition reported the highest behavioral intentions to snack on sugary products (see Table 4).

These results supported the findings on the apple-donut task, and the participants in the scarcity condition were more willing to snack on sugary products. Importantly, the sequence of scarcity and abstract prime revealed that the induction of an abstract construal level reversed the effect of scarcity.

To repeat the analysis on drinking alcohol (SDB scale), we first calculated the final quantity of alcohol each participant chose to drink at the party by multiplying the amount of alcohol in the glass by the number of glasses. ANOVA showed a significant effect of condition,  $F(3, 140) = 7.50$ ,  $p < .001$ ,  $\eta^2 = .14$ . Table 5 shows how much alcohol the participants chose to drink in a party. The results supported previous findings that showed that the scarcity condition was associated with the highest-risk behavioral intentions. The participants in the scarcity prime condition were willing to drink more alcohol than the participants in the other conditions. Once again, abstraction reversed the effect of the scarcity manipulation, and the participants in the condition with



**Table 5** Means (SDs) on drinking alcohol

Condition	Mean (SD)
Control	9.76 (1.40) <sub>a</sub>
Abstraction	7.37 (1.33) <sub>a</sub>
Scarcity+ Abstraction	11.08 (1.38) <sub>a</sub>
Scarcity	16.08 (1.35) <sub>b</sub>

Means in the same column that do not share the same subscripts differ at  $p < .05$

the two opposite primes reported drinking intentions similar to those of individuals in the control and abstract conditions.

## Discussion

We found similar results when we measured current behavior and behavioral intentions. The participants in the scarcity condition reported the highest-risk behavior. When people feel without that they lack enough money to live comfortably, they choose the tastiest but the least healthy of the options. Importantly, the results obtained in the sequential opposite double priming condition (scarcity and abstraction) supported the link between feelings of scarcity and the concrete construal level. Thus, we highlight two relevant findings. First, because scarcity promotes a concrete construal level, as Studies 1–3 revealed, and the concrete style is associated with low self-control (Fujita, 2008), the participants in the scarcity condition reported more unhealthy decisions. Second, abstraction reversed the effect of scarcity in the two opposite prime condition, which supports the scarcity-concrete construal link and suggests the possibility of changing unhealthy behavioral tendencies by promoting a more abstract style of thinking. These results show the mediating role played by the concrete construal level on the unhealthy behavior found in scarcity contexts.

## Study 5: Construal Level and Risk Behaviors in Populations at Risk of Social Exclusion

Studies 1–3 supported the link between perceived economic scarcity and the concrete construal level. Study 4 revealed that induced scarcity promoted a concrete construal level that implied greater risk intentions and behaviors; we reversed this effect by experimentally inducing an abstract mindset that made participants select healthier options. All these previous studies were conducted with university students as participants. Now, the challenge is to replicate those results in a natural context where people are truly suffering severe economic problems.

Study 5 examined the effect of scarcity in a sample of participants attending job placement workshops because they

had been unemployed for a long time (more than 12 months). These workshops were only offered to people with economic conditions of vulnerability. Based on our previous results, we expected that this sample would present a concrete style of thinking; however, because construal level is a continuous dimension ranging from concrete to abstract style (see Trope & Liberman, 2003; Vallacher & Wegner, 1989, 2012), some individuals could maintain a more abstract style even in those difficult economic conditions (see Aguilar et al., 2020). People suffering scarcity who think more concretely will be more prone to carry out risk behaviors, while individuals suffering economic problems, who present a more abstract style, will report healthier behavioral intentions.

## Method

### Participants

Two hundred thirteen participants who were attending job placement workshops organized by several NGOs (Caritas, Don Bosco, Red Cross) ( $M_{\text{age}} = 27.9$ ,  $SD = 7.2$ , 105 males) voluntarily and anonymously completed a questionnaire.

### Procedure

Participants answered the questionnaire at the end of one session in the workshop. They were informed that anonymity was guaranteed and that it was very important that they respond honestly. All participants signed a consent form to participate. The questionnaire included the following measures:

**Construal Level Measured as Personal Disposition** First, construal level was measured with a short version (14 actions) of the Behavioral Identification Form (BIF; Vallacher & Wegner, 1989; Fujita et al., 2006). Higher BIF scores represent a greater tendency to identify behaviors at a more abstract level ( $M = 8.30$ ;  $SD = 3.0$ ). The Cronbach's alpha was acceptable ( $\alpha = .75$ ).

**Risk-Health Behavioral Intentions** After completing the BIF, participants reported their behavioral intentions in three risk behaviors (alcohol, snacking salt products and snacking sugary products) and three health behaviors (eating fruits and vegetables, exercising and medical checks). The intentions were measured on a 7-point scale (1 = *not at all*, 7 = *very much*). We averaged behavioral intentions on risk ( $\alpha = .65$ ) and health indexes ( $\alpha = .47$ ).

## Results

We used the first and fourth quartiles of the abstractness index to split the sample into extreme abstract and extreme

concrete construal levels. This analysis was based on the theoretical framework of construal level theory, which points out that all predictions must be understood from a comparative perspective (see MacGregor et al., 2017). Thus, the most abstract scores ranged between 11 and 14 scores ( $N=71$ ), and the most concrete scores ranged between 1 and 6 scores ( $N=66$ ). ANOVAs showed that both groups differed significantly in the risk behavior index ( $M_{concrete}=3.63$ ,  $SD=1.19$  vs.  $M_{abstract}=3.17$ ,  $SD=1.50$ ),  $F_{risk}(1,135)=3.84$ ,  $p=.05$ ,  $\eta^2=.028$ , and almost significantly in the health behavior index ( $M_{concrete}=4.66$ ,  $SD=1.18$  vs.  $M_{abstract}=5.02$ ,  $SD=1.23$ ),  $F_{health}(1,135)=3.07$ ;  $p=.08$ ,  $\eta^2=.022$ . Participants in the more concrete group presented higher risk behavioral intentions.

## Discussion

When testing the role played by construal level on risk and health behavioral intentions in people suffering real economic scarcity, the results supported the links between poverty, concrete mindset and risk behavioral intentions. In severe economic circumstances, individuals who think more concretely are more prone to intended risk behaviors. However, people experiencing severe economic problems who were able to maintain a more abstract style reported fewer risk behavioral intentions. Similar results were found in a sample of adolescents in Nicaragua (see Aguilar et al., 2020).

## General Discussion

The link between poverty and unhealthy behaviors is clearly supported by statistics and experimental studies. Although multiple causes are involved to explain why this link exists, in the present study, we have focused on the role played by the concrete construal level. The asymmetry of choosing between tempting-unhealthy or uncomfortable-healthy consequences poses a self-control problem for everyone, but it is especially harmful for people in poverty because they must face more difficulties without enough resources and support.

The findings of research focused on cognitive changes induced by scarcity (e.g., Mani et al., 2013; Shah et al., 2012) match those of research that explores how people's construal level affects decisions that involve self-control (e.g., Fujita, 2008; Fujita et al., 2018; Fujita & Han, 2009). When individuals suffer economic scarcity, they focus on their immediate situation without attending to the future consequences of their actions, thus losing opportunities to overcome their problem (Mullainathan & Shafir, 2013). Avoiding consideration of the long-term outcomes is precisely what characterizes the concrete construal level associated with the lack of self-control (Fujita, 2008; Fujita & Han, 2009).

Numerous studies show that people under scarcity make unhealthy decisions that worsen their already precarious situation. Especially in eating behaviors, poor people prioritize behaviors that are pleasant in the short term (e.g., greater calorie intake) but harmful in the long term (Bratanova et al., 2016; Hill et al., 2016; van Rongen et al., 2019). This difference between short-term and long-term preferences connects directly to construal-level research, where psychological distance is one of the main factors that determines what information is considered to mentally represent a behavior and thus the behavioral decision. CLT findings consistently support that an abstract mindset implies prioritizing the final goals of the actions, rather than the immediate results, which promotes greater self-control and healthier behaviors in the long term (Carrera et al., 2018; Chiou et al., 2012; Fernández et al., 2018; Fujita, 2008; Fujita & Han, 2009; Fujita et al., 2006; Sweeney & Freitas, 2014; Trope & Liberman, 2000). While an abstract style of thinking is associated with healthier choices, a concrete style favors risk behaviors.

The links between the lack of economic resources and unhealthy behaviors and between the concrete construal level and the lack of self-control support the relationship between economic scarcity and the concrete construal level that we found in the present research. Studies 1–3 supported the relationship between perceived economic scarcity and a concrete construal level. In Study 1, we manipulated the lack of economic resources using a priming task. The participants in the scarcity condition (versus the control condition without any prime) perceived the task of generating actions' effects more easily than the participants without economic problems, a result previously associated with a concrete construal level (see Rim et al., 2013). Study 2 replicated this effect using the scale most commonly used to measure changes in construal level (see Burgoon et al., 2013): the BIF scale designed by Vallacher and Wegner (1989). Construal level was measured before and after the economic manipulation, and the data revealed that the participants changed their construal level to a more concrete style after scarcity induction, while the participants in the nonscarcity condition presented a more abstract construal level. In this second study, the participants in the control group were induced to feel that they had enough money to live comfortably (middle socioeconomic status). In Study 3, the participants reported their real income and completed the BIF scale. This correlational study supported the results found in the experimental context: the participants in the poorest situation presented the most concrete construal level.

Study 4 supported the mediating role played by the concrete construal level in the influence of economic scarcity on risk behaviors. For testing, we used the double opposite priming procedure used by Gardner et al. (2014). In the experimental condition where only poverty was induced, the participants made unhealthy behavioral decisions; this

result indicated that scarcity promoted risk behaviors, supporting Studies 1–3. In one of the experimental conditions, after the prime of scarcity, participants were induced to think abstractly, and this second prime reversed the effect of scarcity: individuals selected healthier options at a similar level to that of the individuals in the control condition (without any primes) and the abstract condition (without economic prime). The similarity between the participants in the scarcity-abstraction condition and the participants in the control and abstraction conditions, along with the difference between these groups and the scarcity group, reveals that the participants in scarcity had adopted a more concrete style of thinking that promoted more risk behaviors.

Study 5 explored the links between economic scarcity, concrete construal level and health-risk behavioral intentions in a real context of economic vulnerability. The results showed that people who maintain a concrete construal level under severe economic difficulties reported more risk behavioral intentions than individuals who were able to maintain an abstract mindset. An abstract style of thinking could be considered, such as a protective factor against some risk behaviors in contexts of economic vulnerability.

In sum, these results reveal the complex relationship between economic scarcity, concrete construal level and risk behaviors. Concrete thinking implies focusing on the immediate situation, which might facilitate adaptation to the demanding conditions that characterize scarcity contexts but leaves people without a broad perspective of the future, a view that is necessary for people to make safe decisions in situations that involve self-control, such as health-risk behaviors. Importantly, our results show that an abstract construal level reversed the effect of scarcity. Because an abstract construal level can be induced following different procedures even in natural settings (see White et al., 2011), these findings open up challenging ways to improve the conditions in which people in scarcity contexts make behavioral decisions. We note that this strategy could only be used to avoid behaviors where people in conditions of economic vulnerability can freely make decisions (e.g., snacking); unfortunately, there are many behaviors that imply risk and that these people cannot avoid even if they want to do it (e.g., access to healthy housing). Although we must all continue working to reduce situations of economic scarcity, until that ideal goal is achieved, we can mitigate the effects of poverty by promoting an abstract style of thinking, especially in populations in vulnerable situations.

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## Declarations

**Ethical Approval** The experimental protocol employed in the present study was approved for ethical treatment of human participants by Universidad Autónoma de Madrid (Spain), following the American Psychological Association's Ethical Principles in the conduct of research with human participants (2010). All measures, manipulations, and exclusions in the studies are disclosed, as well as the method of determining the final sample size (see p. 7).

**Informed Consent** Informed consent was obtained from all individual participants included in the studies.

**Conflict of Interest** On behalf of all authors, the corresponding author states that there is no conflict of interest.

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