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► **To cite this version:**

Claire Pellegrin, Gilles Grolleau, Naoufel Mzoughi, Claude Napoleone. Does the identifiable victim effect matter for plants? Results from a quasi-experimental survey of French farmers. *Ecological Economics*, 2018, 151, pp.106–113. 10.1016/j.ecolecon.2018.05.001 . hal-01992418

HAL Id: hal-01992418

<https://institut-agro-montpellier.hal.science/hal-01992418>

Submitted on 12 Sep 2023

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Does the identifiable victim effect matter for plants? Results from a quasi-experimental survey of French farmers¹

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Abstract: Numerous studies showed that people respond more generously to individual identified victims than to equivalent statistical victims, which is referred to as the “identifiable victim effect” (IVE). While the previous literature examined the IVE for human and animal victims, we focus on vegetal entities that can be threatened. Thanks to a between design allowing to increase the degree of plants’ identifiability, we test whether IVE is likely to enhance farmers’ participation in a conservation program, using mail survey data among a sample of French farmers located in the Vaucluse area. Unlike humans and animals, we found that IVE does not matter regarding plants, as farmer willingness to participate in the compensation measures was found to decrease as the (plant) victim(s) become more identifiable. Moreover, this figure is even stronger with respect to organic farmers compared to their conventional counterparts.

Key-words: Environmental policy; Farmers; Identifiable victim effect; Nudge; Plant blindness.

JEL codes : Q19, Q28, Q38, Q57.

¹ The authors are grateful to Sophie Clot, Katherine Farrow, Lisette Ibanez, and Estelle Midler for their useful comments and suggestions. They also thank the VITAL program for financial support. This study is also a part of CompAg program supported by INRA Ecoserv and ANR PRCE 2017.

Does the identifiable victim effect matter for plants? Results from a quasi-experimental survey of French farmers

“A single death is a tragedy; a million deaths is a statistic.”

Joseph Stalin

1. Introduction

One of the major limits of the scope and efficacy of environmental programs is the lack of farmer participation (Carey et al., 2005). The conventional prescription to low enrolment provided by economists is generally the introduction of monetary incentives for participation. Given that farmers are considered to be rational agents who seek to maximize their profits, payments that are likely to increase net profits are expected to be effective in encouraging them to adopt environmentally-friendly practices. Nevertheless, despite the role of monetary incentives in changing farmer behavior, several scholars point out the limitations of such strategies (Kleijn et al., 2001; Pattanayak et al., 2010). Indeed, several policies based on monetary incentives have been found to be less effective than expected. The European agri-environmental schemes, for example, were faced with a low rate of farmer participation that ultimately reduced the effectiveness of the program (Hanley et al., 1999).

Based on research in behavioral economics (Kahneman, 2003), an increasing number of studies show that focusing on behavioural capital, defined as *“the latent potential of behavioral change to affect improvement in environmental quality”*, may constitute a fruitful approach (Beretti et al., 2013). In particular, the use of nudges (Thaler and Sunstein, 2008) is being increasingly presented as a powerful tool to push farmers to take part in environmental programs (de Snoo et al., 2013; Kuhfuss et al., 2014). A nudge is *“any aspect of the choice architecture (...) that alters people’s behavior in a predictable way without forbidding any options or significantly changing their economic incentives. To count as a mere nudge, the intervention must be easy and cheap to avoid”* (Thaler and Sunstein, 2008). Nudges could be used, for example, to increase farmer participation in such programs, to ensure a change in agricultural practices or to encourage farmers to continue newly adopted practices beyond the requirements stipulated by a formal commitment. Notably, these types of interventions have the capacity to increase the effectiveness of a program with little or no need for additional funding. For example, (Duflo et al., 2011) demonstrated that strategic timing of incentive implementation reduces farmer procrastination and can increase the effectiveness of a policy. At the same time, nudge approaches are not ‘catch-all’ solutions, given that they have their own limits and drawbacks (Loewenstein and Nick, 2017).

In this paper, we explore the potential of a nudge as a means to encourage farmers to realize compensation measures on their lands, namely the identifiable victim effect (IVE).² The IVE refers to an individual's greater willingness to offer a support to single, identifiable victims than to anonymous or statistical victims (Jenni and Loewenstein, 1997). It has been notably argued that affect elicited by identifiable stimuli can lead people to give more to identifiable individuals relative to statistical victims (Genevsky et al., 2013). A famous example of the IVE in the real world is the story of a baby named Jessica who fell into a well in Texas in 1987 and received over \$700,000 in donations from the public in one month (Lee & Feeley, 2017). During the last decade, several studies have shown the benefits for charities of describing a single needy beneficiary rather than explaining the impact of their actions at a large scale, to raise funds (Kogut & Ritov, 2005; Small et al., 2007). For instance, across several experimental settings, Kogut & Ritov (2005) found that participants were willing to give significantly more money when a single person in need of medical help was described compared to when a group was presented.

The originality of our paper is to test whether the IVE also applies to living beings that are non-human and non-animal such as plants. This extension is important for several reasons. Testing the robustness of the IVE to various contexts is a valuable pursuit, since environmental threats in many situations mainly concern plants that are almost immobile and even inanimate objects. With more than 20% of the world's plants species threatened with extinction, global and local losses of plant diversity are often ignored (Cires et al., 2013). Moreover, individuals are sometimes directly solicited to help save these threatened species. In 2013, for instance, a group trying to preserve the centuries-old Angel Oak near Charleston, South Carolina raised almost \$700,000 from more than 9,000 donors in less than two months (Brodeur, 2017; see also McLeod, 2013). This generosity was notably explained by the '*amazing*' and '*passionate*' '*connection people have to this tree*'. In France, a recent fundraising initiative has been launched to save the plane trees of the *Canal du Midi* in Southern France. Last year, about 7500 donors gave an average amount of €60 each in order to save these trees (Caravagna, 2017). In some schemes, it is also common to emphasize a single species (e.g., a flagship or an umbrella species) as a conservation strategy to encourage policy support. Consequently, it is useful to understand whether the IVE also applies to these almost immobile beings.

² The identifiable victim effect can be considered as a potential nudge given the definition of a nudge provided by Thaler and Sunstein (2008, p. 6). Indeed, as we will see, the IVE is not constraining with respect to individual choice. It is a simple and inexpensive tool that can be used to motivate prosocial behaviors as contributing to charitable works or adopting green behaviors.

The remainder of the paper is organized as follows: Section 2 overviews the related literature, which allows us to formulate testable hypotheses. Section 3 describes the experimental design. Section 4 presents the main results and discussion. Section 5 concludes and provides several policy implications.

2. Related literature and hypotheses

A classical assumption in behavioral economics is that individuals' decisions generally depend more than traditionally expected on affect than on pure rational considerations (Slovic et al., 2002). Several non-mutually exclusive mechanisms (Hsu, 2014; Jenni and Loewenstein, 1997) have been proposed to explain the IVE, notably (i) the *vividness* of an identification that is activated through an emotional story, visual images, and real-time unfolding, (ii) the *certainty effect*, which states that people overweight certain outcomes (e.g., helping an identifiable victim) relative to uncertain ones (e.g., helping statistical victims characterized by a probabilistic threat), (iii) the *reference group effect*, or the tendency of individuals to overweight similar expected risks that are faced by smaller groups (e.g. a single identified victim) compared to those faced by bigger groups (e.g. statistical victims), and, (iv) the *contrast* between evaluating the harm before it occurs (*ex ante*) in the case of statistical victim versus after (*ex post*) in the case of identified victims, which can lead to feeling a greater impetus to help in the latter case relative to the former. Although we may not be able to completely rule out other explanations, emotional reactions have been highly implicated in the impacts associated with the IVE (Genevsky et al., 2013; Erlandsson et al., 2017). Identified victims seem to evoke more powerful emotional responses than do statistical victims, and these responses lead to a greater likelihood of providing help (Small & Loewenstein, 2003). The fact that helping intentions are significantly predicted by helpers' emotions also suggests that individual victims may induce stronger sympathy and distress responses than do statistical victims. In short, feelings about the identified victims are likely to be a critical mechanism behind the IVE (Kogut & Ritov, 2005; Ritov & Kogut, 2011; Cryder & Loewenstein, 2012).

Another potential trigger of the IVE is the entitativity dimension, which refers to “the degree to which a collection of individuals comprises a single coherent entity” (Campbell, 1958). A clear beneficiary entity may increase the perceived proportion of the reference group that is being helped. Since donors are sensitive to this proportion, they tend to be more generous when the reference group to which victims belong is smaller (Bartels & Burnett, 2011). In the case of the IVE, the rationale behind such a statement is that “*the unit of reference for a single identified victim may be the victim herself [...] while donations to statistical victims may be seen as mere drops-in-the-bucket*” (Bartels & Burnett, 2011; Jenni & Loewenstein, 1997).

Moreover, while the beneficiaries of the situations described in the studies exploring the IVE were mostly human, some studies have provided clues regarding the possibility to apply this behavioural

phenomenon to animal species. In the experiment conducted by Desvousges et al. (1993), for instance, willingness to pay to support the protection of migratory birds from exposure to oil ponds increased only slightly when the number of affected birds was increased from 2,000 to 200,000. Similarly, the protection of turtles inhabiting the Mexican coast received more support from participants in a study carried out by Kahneman & Ritov (1994) than the protection of all reptiles in the same region. Nevertheless, these studies did not explicitly consider single identified individuals. Exploring this particular dimension, other studies have found significant effects. One example is the rescue of a dog stranded on a ship adrift on the Pacific Ocean near Hawaii that received more than \$48,000 in donations (Song, 2002 quoted in Small et al., 2007). Markowitz et al., (2013) also found a significant increase in support for polar bears (*Ursus maritimus*) when the identification of specific beneficiaries was made more salient. In another study, Thomas-Walters and Raihani, (2016) found, in a WWF fundraising context, that while the IVE was not effective in increasing donations, flagship species increased donation amounts, compared to non-flagship species. Interestingly, the entitativity effect has also been explored for animals (Smith et al., 2013). Indeed, by presenting the recipient of a donation as *a herd* of 200 gazelles instead of 200 gazelles, the authors found that the support of the participants increased significantly.³

As far as we know, there is no study devoted to plant species. Lewinsohn-Zamir et al., (2017, p8) state that “*no one has yet tested whether an identifiability effect exists with regard to inanimate objects.*” Using a between-subjects design that allows us to increase the degree of identifiability with respect to a single plant species, we test whether the IVE is likely to enhance farmer participation in an environmental conservation program. We accomplish this through the collection of mail survey data among a sample of French farmers located in the Vaucluse area in southeast France. Although some studies (e.g., Berenguer, 2007) suggest that plant species (e.g. a tree) may be less likely to induce empathy compared to animals (e.g. a bird), anecdotal evidence indicates that several specific plants can elicit strong affects (Brodeur, 2017; McLeod, 2013). We thus expect that the IVE matters for plants and formulate the following hypothesis:

H1: Farmer willingness to participate in an environmental conservation program increases with the identification of a previously defined plant.

Moreover, Markowitz et al. (2013) argued that the IVE is more likely to affect non-environmentally oriented people compared to environmentally-oriented ones. They compared the willingness-to-pay of

³ Even if this issue is beyond the scope of our paper, examining the IVE for an entity like a well-identified forest such as the Amazon rainforest could constitute an insightful extension.

self-identified environmentalists and non-environmentalists for saving polar bears (*Ursus maritimus*) and showed that the IVE was significantly stronger among non-environmentalists, who were more generous to identifiable beneficiaries than to statistical beneficiaries, while the self-identified environmentalists were willing to offer similar amounts to both types of beneficiaries. Accordingly, we expect that farmers will react differently to the IVE according to whether they use organic or conventional techniques. Hence, we formulate the following hypothesis:

H2: The IVE is relatively stronger among conventional farmers than for organic farmers.

3. The empirical strategy

In order to test the hypotheses formulated above, we conducted a mail survey in June 2017 among the whole population of farmers located in the French Vaucluse area (N=4423). A cover letter explained that the aim of the survey was to better understand recent practices' changes on farms and the impact of policies on farmers' choices. In order to improve our questionnaire and increase its readability, we pre-tested it among some experts and with a sample of 9 farmers who were not solicited for the final survey. A total of 328 farmers answered the survey (7.4%).⁴ Respondents have the following characteristics: 74% are men, and their average age is 52 years.⁵ Farms activities are mainly in viticulture (54%), fruit-growing (12%), vegetable production (10%), and cereals (5%). Average farm size is 18 ha. In total, 28.4% of the participants use organic production methods on their farms, whereas 62.2% use conventional methods (9.4% didn't answer this question).

We used the following quasi-experimental design: a hypothetical but realistic environmental program was presented to farmers, explaining that the accidental destruction of local rare plant(s) occurred in the nearby area (See Appendix 1 for the survey instrument). Surveyed farmers were asked to participate in the restoration of an adapted environment for the destructed plant(s) by reducing their use of chemical fertilizers and receiving a monetary reward equivalent to that received by farmers of a nearby region for their participation in an ecological mitigation scheme (300€ per year and per ha dedicated to the program). Participants had to indicate their willingness to participate in this program

⁴ The response rate is acceptable given that farmers were solicited during the harvest time, which has been proved to reduce responses (Pennings et al., 2002). Interestingly, using a cross-national mail survey among 22 countries, Harzing, (2000) found that response rates in France are among the lowest. In addition, as reported by Mzoughi, (2014) who conducted surveys in the same area, it is quite difficult to get high response rates among the considered population.

⁵ Even if the representativeness of our sample is not perfect, our sample, as pointed out by a referee, shares some similarities with the whole farmer population of the Vaucluse, notably the fact that 1/3 of the farmer population are women and 52% are 54 years old (<http://www.paca.chambres-agriculture.fr/notre-agriculture/chiffres-cles/#c48632>).

on a scale ranging between 1 (Not at all) to 10 (Definitely). They were also asked to indicate the duration of commitment in the program they would make between 3 year to more than 15 years by 1-year increments.

In order to be more realistic, this environmental program was inspired by an actual recent program, namely, the French ecological mitigation policy. This policy is a part of a more global policy that legally requires developers to avoid, reduce and mitigate as much as possible the environmental damages of their project. Ecological mitigation schemes have the advantage of being relatively unknown by French farmers which permits to control the level of information they had on the scheme. Under some circumstances, this program requires developers to recreate the destroyed environmental amenities in the same area. This context constituted a realistic frame to study the IVE. In the Vaucluse area, natural or agricultural lands represent 85% of the total area. The western part of the region, where most of the agricultural land is concentrated, is subject to significant urban sprawl (Arrighi and Samyn, 2016). The expected urban growth in this area should induce in the future a geographically delineated need for ecological mitigation that could be filled by local farmers.

In order to test the IVE, we used a between-subjects design. We divided the sample into three groups, corresponding to three different treatments. The content and instructions for all treatments were identical in all respects, except regarding the victim(s) of the accident (See Table 1 and Appendix 1 for the whole survey instrument). Each participant was only involved in a single treatment and farmers were randomly assigned to the treatments.

Formally, in treatment 1 (T1 – No identification), individuals were told that 30 plants of various species were affected by the accident, without other information. In the treatment 2 (T2 – Intermediate identification), the victims were described as 30 plants of the same species and were identified by their common or vernacular name only, that is, “Garidelle”.⁶ This arable weed plant is a threatened species on the French national red list. Sensitive to nitrogen concentration in soils, the population of “Garidelle” substantially declined in the Vaucluse area due to fertilizers use. In addition, given its scarcity, it was reasonable to assume that the majority of farmers do not know it. This assumption was confirmed during our pre-test. Moreover, given that in the case of animal conservation issues, aesthetics seems to be important –e.g. “prettier” animal species like Pandas generating more interest and collecting more funds (Kingston, 2015), the choice of “Garidelle” was also motivated by its pretty flower. Indeed, in the treatment 3 (T3 – High identification), the ‘victim’ in question was described as

⁶ *Nigella nigellastrum* (L.) Willk., 1880, Garidelle (French), (Equisetopsida, Ranunculales). Detailed taxonomic information and other characteristics can be found at https://inpn.mnhn.fr/espece/cd_nom/109636 and <http://www.tela-botanica.org/bdtfx-nn-29386-synthese>.

a single plant, identified by its common name and its species name (Garidelle, *Nigella nigellastrum*) along with a photo.

The rationale behind such an identification is based on previous literature on IVE that providing details about the victim makes this effect more pronounced (Lee and Feeley, 2016). First, previous literature has shown that the IVE seems to better work for one victim than for two or more victims (Kogut & Ritov, 2005; Markowitz et al., 2013; Västfjäll et al., 2014). Second, giving personal information, even if minimal, about the victim has also proved to be an important factor in the IVE. For instance, using a laboratory experiment, Charness & Gneezy (2008) found that people were more generous when personal information about the recipient such as family name was provided, compared to the situation where this personal information was not available. Third, of all of the different types of information used to identify victims, the use of a picture seems to be most effective, before age and name (Kogut & Ritov, 2005; Genevsky et al., 2013). We recognize, however, that these dimensions were not studied as they pertain to quasi-immobile beings such as plants. Moreover, even if it is intuitive, apart from their scientific names, plants are rarely given individual names like humans or animals.

Table 1. Treatments used in the survey

	T1	T2	T3
Victim	30 plants of various species	30 plants of the same species	1 plant
Name	-	Garidelle	Garidelle (<i>Nigella nigellastrum</i>)
Picture	-	-	

Despite some weaknesses, e.g., less control, notably when compared to laboratory experiments, a quasi-experimental survey offers a number of advantages. It enables us to control how the program is presented and it allows us to engage farmers in a highly realistic scenario. Their choice to participate or not in an environmental program is usually made in their house. Furthermore, the use of a quasi-experimental survey reduces the experimenter demand effects (Orne, 1962) and offers access to a large number of participants at a reduced cost. Moreover, we used a non-incentivised survey which has been proven to give similar qualitative findings as incentivized surveys (El Harbi et al., 2015; Graf et al., 2012; Rubinstein, 2013) (Thaler, 1987). On this subject, Thaler (1987, p.120) wrote: “asking purely hypothetical questions is inexpensive, fast, and convenient. This means that many more experiments can be run with much larger samples than is possible in a monetary-incentives methodology”.

Nevertheless, we admit that every methodology has its advantages and disadvantages and we do not want to present a biased perspective. For instance, we cannot rule out completely the legitimate concern of whether hypothetical questions reveal accurate preferences (eg Charness et al., 2013; Hertwig and Ortmann, 2001).

4. Results and discussion

The mean of individuals' responses by treatment for both the level of support and duration of commitment are presented in Table 2 below. Along an increasing gradient of identification of the victim (from T1 to T3), the level of support decreases, even if these differences are not significant. The tendency is almost identical for the duration, even if the decrease seems stronger in the intermediate identification treatment than in the high identification treatment. Although we observe slight variations across groups, a Kruskal-Wallis rank sum test shows that they are not significant. Specifically, farmers did not indicate significantly different responses across treatments in terms of their level of support (p-value = 0.8454, Kruskal-Wallis chi-squared = 4.8706, df = 9) or the duration of their commitment (p-value = 0.537, Kruskal-Wallis chi-squared = 9.9271, df = 11). These first results concur with the findings of Thomas-Walters and Raihani (2016) regarding animal beneficiaries, in which the participants of their study did not donate different amounts to identified or statistical victims.⁷

Table 2. Mean responses by treatment (N=328)

Treatment	Level of support	Duration
T1 (No identification)	5.851	7.269
T2 (Intermediate identification)	5.832	5.865
T3 (High identification)	5.309	6.624

In order to take into account potential individual heterogeneity, we also examined the effect of identification on the support level and duration commitment applying an ordered probit regression

⁷ In order to test the robustness of these findings among non-farmers but without over-generalizing, we conducted another quasi-experimental survey using the same design among a convenience sample of 184 individuals, among which 106 respondents were students. This additional study was conducted in the same French region in October and November 2017. In order to fit a non-farmer sample, we described exactly the same program as the one presented to farmers and explained in the survey that the program was in need of financial support. Similar to the main study, individuals were randomly assigned to one of the three treatments considered and were asked to indicate their willingness to financially support the program on a similar scale, ranging from 1 to 10. The findings are quite similar to those for the main study, as the mean support level was equal to 5.42, 5.22 and 5.25 for treatments T1, T2 and T3, respectively. In other words, we find no significant effect of identification on donation intentions.

(Greene, 2003), used when potential values of the dependent variable are ordinal. For ease of exposition, we only report the results regarding the support level, since those for the duration commitment were not significant. Controlling for age, gender, education level, main activity (vegetables production, fruit-growing, viticulture, and cereals) and production type (organic versus conventional), we find that respondents in treatment T3 are likely to report significantly lower levels of support (Table 3), but only at the 10% level. These first results do not support our hypothesis H1 since the level of farmer support for the considered compensation measures was found to decrease with the level of identifiability, notably when considering T1 and T3. These findings echo those of Wiss et al., (2015) for Swedish subjects where participants were asked to choose to support one child or a group of five children: when the single beneficiary was more identified, he received less support. The authors give two possible explanations to this finding: emotional reactance and emotional upscaling. The former captures the insight that individuals might have experienced a pressure and felt obliged to help the single child. Emotional upscaling is due to the use of a joint evaluation design⁸ with two options presented side-by-side and refers to the idea that individuals' responses to help one child could have been transferred to the group. In other words, their emotions for the single child made them expressing more intense emotions for the group of children. It is possible that some participants in our survey expressed a similar kind of emotional reactance. Nevertheless, given that there are several differences between their study and ours (e.g., humans *versus* plants, cultural context [US-Sweden *versus* French participants]), we remain cautious regarding the possible convergences. Last but not least, the results stress the importance of production type (organic vs. conventional) in farmer support for the program.

⁸ Given that we do not use a joint evaluation design, we can rule out this explanation.

Table 3. Ordered Probit estimates of the effect of identification on the support level

Variables	Coefficients and significance
T3 (High identification)	-.3021837 *
T2 (Intermediate identification)	-.1570369
Age (= 1 if more than 40 years old)	.079417
Gender (=1 if male)	.0062632
Organic (=1 if true)	.5641982 ***
Education (=1 if high educated)	.123148
Fruit growing (=1 if true)	-.0337521
Vegetable production (=1 if true)	.5465308 **
Viticulture (=1 if true)	-.0455425
Cereals (=1 if true)	-.2059089
Pseudo R ²	0.0299
Log pseudo-likelihood	-465.78776
Number of observations	237 ^(a) .

(*), (**) and (***) stand for significance at the 10, 5 and 1% level, respectively; (a): 91 surveys were removed when participants did not answer to at least one of the variables described above.

Let us now examine the results in perspective of hypothesis H2 stating that the IVE is relatively stronger among conventional farmers than for organic farmers. Regardless of the treatment, a comparison of responses between these groups indicates a significant difference in support for the environmental program (Kruskall-Wallis test, chi-squared = 17.991, df = 1, p-value = 2.219e-05), which is in line with the significance of the variable “organic” in Table 3. Organic farmers show, indeed, more interest for the program with a mean level of support around 7 and a mean commitment duration around 8.7 years whereas conventional farmers’ mean level of support is 5.1 and mean commitment duration is of 5.7 years. However, when comparing the responses by treatment (see Table 4), our results suggest that our hypothesis H2 is not supported, since the figures obtained for organic and conventional farmers are quite similar to that obtained for the sample as a whole. Indeed, a Friedman test followed by a post-hoc Conover test⁹ was used to compare the support level given by the organic farmers across treatments. Organic farmers express significantly stronger support in treatment T1 (without identification) (Friedman chi-squared = 6.5882, df = 2, p-value = 0.0371). They also choose longer contract durations in treatment T3 compared to those in the two other treatments, but the difference is not significant. The results of the same tests conducted on conventional farmers

⁹ The Conover test (Fuller et al., 1973) allows for multiple comparisons between individual treatments.

were not significant.¹⁰ These results are different from what has been found in other studies on human and animal victims. Although significantly related to the level of support of the considered measure, participants' type (organic versus conventional) does not impact their reactions to the high identification treatment.

Table 4: Mean responses by treatment and farmers' category (organic versus conventional)

Treatment	Organic farmers (N=93)		Conventional farmers (N=204)	
	Support	Duration	Support	Duration
T1 (No identification)	7.812	10.25	5.478	6.761
T2 (Intermediate identification)	7.03	7.903	5.349	4.984
T3 (High identification)	6.607	8.63	4.8	5.833

Discussion

In the following we provide some tentative explanations for our results. First, our findings could be explained by the fact that a single or 30 plants may be not enough to constitute an entitative group in participants' minds. Numerous studies have indeed shown that humans have superior recall for animals relative to plants, a phenomenon referred to as 'plant blindness'. For example, Schussler and Olzak (2008) compared recall of pairs of animals and plants among 124 psychology students and 203 botany students at a U.S. university. Animal images were recalled significantly more than plant images, and this trend was maintained for both botany and psychology students.

Second, another explanation is that plants do not have the same capacity for evoking empathy. Empathy is a strong trigger of IVE and if plants represent "our limit to empathy" (Marder, 2012), it could explain why farmers' appear disinterested in the fate of individual plants. Berenguer (2007) showed that empathizing with nature can increase concern and practical support for species conservation, in the case of animals (birds) and plants (trees), writing (2007, 281): "People may identify more closely, at a cognitive level, with the bird than with the tree, so the level of inclusiveness will be higher in the case of the bird." However, given that we did not measure emotions, our argument is rather speculative. In other words, we cannot provide a clear-cut conclusion regarding whether the null results come from a lack of empathy or any other emotions. Indeed, other emotions besides empathy or sympathy could play a role in the IVE. For example, Erlandsson et al., (2016) suggest that anticipated guilt (or other negative emotional consequences) as well as anticipated warm glow (or other positive emotional consequences) could play a role as well, which in turn depends on perceptions of responsibility. Their results suggest that people anticipate guilt if not doing their duty

¹⁰ To go further, we also analysed the extreme answers for both the level of support and duration. The results for both organic and conventional farmers suggest a stronger support for the less identified victim (T1) compared to the highly identified victim (T3).

but that they anticipate warm glow primarily when doing over and beyond their duty. For instance, Erlandsson et al., (2016, 2015) found that emotional reactions, either positive or negative ones, are the primary mediators of the IVE and are affected by personal responsibility to help. Logically, if farmers do not assume any personal responsibility regarding the destruction and/or the restoration of rare plant species, it is plausible that this lack of responsibility does not generate the emotional reactions needed to engage in prosocial activities.¹¹

Third, as professionals who have daily contact with plants, farmers could have a particular relationship with plants that makes them less sensitive to the loss of plants, especially if they do not seem useful from a farming standpoint. Indeed, some studies indicate that farmers might view biodiversity in a more functional view way than others (Fischer and Young, 2007; Soini and Aakkula, 2007). For example, Herzon and Mikk (2007) find that farmers showed more interest in learning about useful plants species than when they were considering birds or mammals (in general, not specifically breeding species). It could be interesting to test if the lack of IVE observed with plants is robust by considering other types of contexts (e.g. plants useful from a farming standpoint, historical trees) and participants (e.g. farmers, citizens).

5. Conclusion and implications

Using a mail survey among a sample of French farmers with a between-subjects design, we explored whether the identifiable victim effect matters for plants. Unlike previous literature relating to human and animal victims, the level of farmer support for the implementation of ecological compensation measures and expected contract duration were not affected as the (plant) victim becomes more identifiable. The lack of plant IVE holds for both organic and conventional farmers. Nevertheless, even if not statistically significant, our results suggest that farmers' reactions differ according to whether the farmer practices organic or conventional agriculture. Indeed, while high victim identification leads to a significantly lower level of support among organic farmers, it seems that conventional farmers are relatively less supportive of the program itself regardless of victim identification level (since support levels are not significantly different across treatments). At first glance, our results indicate that high identification has no significant impact on support for an environmental program overall, and that among organic farmers, it even appears to reduce support.

¹¹ As pointed out by an anonymous referee, measures of self-efficacy, that is, the (positive or negative) belief in one's behavior to make an actual difference (Bandura, 1977), could have given insight into whether farmers think that their own behavior actually makes a difference in restoring the plant loss. For instance, Wu and Mweemba, (2010) showed that farmers' positive perception of their capability to improve the environment increased significantly their adoption of greener agricultural practices. Moreover, the link between self-efficacy and IVE has been showed by Sharma and Morwitz (2016) who found that boosting perceived self-efficacy reduced the IVE and enhanced supports for multiple compared for single beneficiaries.

Nevertheless, we do not suggest to ‘throw the baby out with the bathwater’, especially if we take into account anecdotal evidence regarding the efforts made and large sums of money that have been raised for specific trees (e.g. Angel-Oak trees, plane trees along Canal du Midi). Quite the contrary, environmental policymakers and environmental activists should consider the actual capacity of specific plants to elicit emotions among targeted groups (e.g. inhabitants, farmers) before using them as flagship species for a program. Furthermore, an evaluation of participants’ feelings could be very interesting to precisely estimate if this presumed trigger of IVE was activated or not in the case of plants *per se* and by the different levels of plants identification.

As previously described, our experiment was not incentivized, meaning that participants’ choices did not have any financial implications. Reproducing our test with a financial incentive could be of interest in order to explore whether participants’ answers would be different if money were at stake. Another point, raised by Wiss et al. (2015), is that the IVE may be affected by cultural considerations: strong differences in reactions to the same intervention using an identified beneficiary were observed between Sweden and American participants. Testing the effectiveness of IVE regarding plants species in countries other than France could also be useful in order to improve the reliability of this phenomenon. A natural candidate could be, for example, a country such as Lebanon that has identified the Cedar tree as its national emblem, which could mean that it is more likely to elicit affect among Lebanese citizens. Moreover, one may also argue it is possible that the lack of an IVE effect in our study was due to factors relating to farmers’ attitudes towards Garidelle specifically. It would be then interesting to replicate this study using multiple examples of species for the identified plants and controlling *ex ante* farmers’ attitudes related to these examples, instead of just Garidelle. Given that Thomas-Walters and Raihani (2016) found that using flagship animal species was effective, the IVE could also be tested in the case of more common plant species which are a part of the everyday life of participants. The plant used in our test was presumably quasi-unknown to the participants. The potential loss of a familiar plant could provoke a more powerful emotional reaction amongst participants than an unknown endangered one. Finally, our experiment presented farmers with a scenario in which a plant victim had suffered a loss and offered them the opportunity to contribute to the mitigation of this loss. The lack of effectiveness of the IVE in this situation could also be explained by the fact that the plant victim in question had already been lost. Given that the sensitivity to an emergency has been proven to increase donations (Sargeant, 1999), evaluating the impact of the timing of a threat on the IVE should also be tested. Consequently, more studies are necessary to investigate the scope of the IVE and the conditions that are likely to determine its overall effectiveness.

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Appendix 1: Survey instrument [Translated from French]

[For ease of exposition, we highlight in bold the changes across treatments]

Treatment 1 (No identification, one third of the farmer population)

An accident that occurred on a construction site of the municipality destroyed **30 plants of various rare species** on the national red list of plants to be protected. In order to restore this damage, voluntary farmers could participate to a fertilizers reduction program in favour of green manure/leguminous to recreate a favourable environment for **these species**. Each farmer could commit with a monetary reward of 300€/ha/year.

Treatment 2 (Intermediate identification, one third of the farmer population)

An accident that occurred on a construction site of the municipality destroyed **30 plants of Garidelle, a rare species** on the national red list of plants to be protected. In order to restore this damage, voluntary farmers could participate to a fertilizers reduction program in favour of green manure/leguminous to recreate a favourable environment for **Garidelle**. Each farmer could commit with a monetary reward of 300€/ha/year.

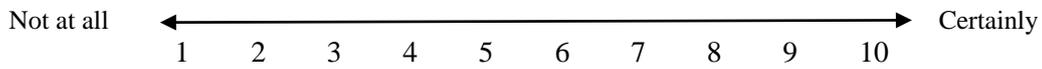
Treatment 3 (High identification, one third of the farmer population)

An accident that occurred on a construction site of the municipality destroyed **1 plant of Garidelle (Nigella nigellastrum), a rare species** on the national red list of plants to be protected. In order to restore this damage, voluntary farmers could participate to a fertilizers reduction program in favour of green manure/leguminous to recreate a favourable environment for **Garidelle**. Each farmer could commit with a monetary reward of 300€/ha/year.



**FLOWER OF NIGELLA
NIGELLASTRUM**

1/ If you were actually asked to participate to this program, would you do it? (Please circle a number between 1 and 10)



2/ Considering that the minimum commitment period would be 3 years, for how long would you commit to adopt these practices? (Please choose the answer that is applicable to you)

- | | | | | | | | | | | | | | |
|---------|---------|---------|---------|---------|---------|---------|----------|----------|----------|----------|----------|----------|--------------------|
| 3 years | 4 years | 5 years | 6 years | 7 years | 8 years | 9 years | 10 years | 11 years | 12 years | 13 years | 14 years | 15 years | More than 15 years |
|---------|---------|---------|---------|---------|---------|---------|----------|----------|----------|----------|----------|----------|--------------------|

Information about your farm

<p>What is the main production of the farm? (only 1 answer)</p> <p><input type="checkbox"/> Cereals <input type="checkbox"/> Fruit growing</p> <p><input type="checkbox"/> Viticulture <input type="checkbox"/> Livestock production</p> <p><input type="checkbox"/> Vegetable production <input type="checkbox"/> Fodder production</p> <p><input type="checkbox"/> Other: _____</p>	<p>How do you manage your farm? (only 1 answer)</p> <p><input type="checkbox"/> Conventional <input type="checkbox"/> Conservation agriculture</p> <p><input type="checkbox"/> Organic <input type="checkbox"/> Other: _____</p>
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Information about you

Gender : <input type="checkbox"/> F <input type="checkbox"/> M	Year of birth : _____
Level of education?	
<input type="checkbox"/> Primary school	<input type="checkbox"/> Secondary school (first stage)
<input type="checkbox"/> Secondary school (second stage)	<input type="checkbox"/> University / High school