Soc Just Res (2013) 26:272–300
DOI 10.1007/s11211-013-0192-0

Ecological Belief in a Just World

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Published online: 11 August 2013

Abstract To date, there is considerable evidence that the perception of injustice influences environmental behavior in a positive way. Nevertheless, some people do not take action, even if the injustice seems obvious. Concerning this matter, approaches like the belief in a just world theory or system justification theory provide an explanation. However, so far, there is no scientific research on whether the perception of ecological justice, which is taken for granted, concerning an ecological belief in a just world (EBJW) may lead to differences in people's environmental behavior. This paper investigates a newly conceived construct of the EBJW, regarding its occurrence as well as its disposition in the context of other constructs. Therefore, a new scale has been developed for the purpose of this study by means of a questionnaire with German citizens ($n = 312$) examining motives for energy-relevant behavior. The scale analyses confirm the validity of the new scale. Even though the EBJW did not score high in the total sample, possibly due to significant differences between the participants (particularly socio-demographic variables and different group memberships) it can be stated that there is definitely a relationship between the EBJW and justification arguments and, ultimately, a lack of responsibility for energy saving. Regression analyses reveal that the EBJW, together with cognitive and affective appraisals of justice, can explain energy-relevant commitment, such as engagement in behavior that has negative impact on the climate. Based on these findings, it is suggested that the EBJW is measurable and that it seems to warrant further research.

Keywords Environmental justice · Ecological justice · Belief in a just world/ecological just world · System justification · Energy-relevant behavior

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Environment and Justice

Since the late 1960s, psychological research has focused on environmental concerns (Gifford, 2007). The energy crisis in the 1970s can be seen as an impetus to environmental research in psychology (Kushler, 1989). Prior to this, environmental hazards were mainly regarded as technical problems, which had to be resolved by technical solutions, and technical approaches dominated the scientific landscape (Kals, Becker, & Ittner, 2006). However, with the ongoing realization that human behavior plays an important part in the causing and solving of environmental problems, there is widespread agreement that psychologists can make a contribution to analyze and solve global environmental problems and that psychological and technical approaches complement one another (Clayton & Myers, 2009; Steg & Vlek, 2009; Stern, 2011).

Many justice-related issues exist in this context. One of the crucial questions concerns the distribution of benefits that go hand in hand with the pollution and destruction of the natural environment (such as economic growth, job security, high standard of living, freedom of choice, etc.) on the one hand and the hazards and burdens due to the ecological impact on the other hand: Who has the opportunity and right to enjoy a healthy and natural environment and under what conditions? Is it fair that people have to face the consequences of environmental hazards caused by others? To what extent should these people (often living in other geographic areas, e.g., the "third world") or people of future generations be given a say? What political instruments regulate these costs and benefits to determine what conditions are fair? How should these political decisions be made and integrated and whose interests should be represented in this decision-making process?

Research about these and many more questions of ecological justice have increasingly become a very important field of investigation in environmental psychology (Clayton, 1996; Syme, 2012). Justice related to the environment has become a crucial issue (Clayton, 2000) and is classified as a key dimension (Opotow & Clayton, 1994). Within this dimension, distributive justice is especially relevant and can be seen as the main topic in this context (Leist, 2007). Pertaining to the natural world, the distribution often is not considered fair at all. Typically, the impacts of harms and risks befall those who have not caused them (as these ecological costs are socialized) and, in contrast, humans who benefit from pollution by attaining personal and/or economic advantages resulting from harm done to the environment, often remain unaffected (Opotow & Clayton, 1994).

One important and consistent empirical finding is that the perception of ecological injustices motivates pro-environmental behavior (Clayton, 2000; Horwitz, 1994; Kals et al., 2006; Nancarrow & Syme, 2001). In contrast, being confronted with injustice is not necessarily accompanied by resentfulness or apathy (Clayton & Myers, 2009; Montada & Kals, 2000; Syme, Kals, Nancarrow, & Montada, 2006), but it does motivate the need to resolve perceived injustice and, accordingly, to compensate this by a certain behavior (Kals & Russell, 2001).

A novel question and the central issue of the present paper is whether there is a (dispositional) ecological belief in a just world (EBJW).

Ecological Belief in a Just World

Even though perceptions of ecological injustice motivate pro-environmental behavior, not all people perceive the environmental inequalities as unjust or are motivated to protect the environment. Even if the injustice seems obvious, not everyone acts against it. There are attempts in environmental psychology to explain this inaction (e.g., Gifford, 2011), but few are based on ideas from justice research. Is it possible that people differ in the ways they think about ecological justice? If so, can these differences be conceptualized as traits? In order to answer these questions, we aim to develop a new concept which indicates the belief that the world is basically an ecologically just place where everyone gets what he/she deserves concerning ecological resources.

The natural environment stands at the core of the construct. The term "natural" has been chosen to distinguish the natural environment from others, specifically the anthropogenic environment, just as well as the social or cultural environment. Hence, to be able to operationalize the construct, it has to be clarified under what conditions circumstances can be regarded as ecologically just.

To psychologists, "ecological justice" is a multi-faceted construct. This is due to the fact that psychological justice research does not aim to determine universally valid criteria for what is seen as just, but rather to encompass the subjective sensation of perceiving something as just or unjust (Schmitt, 1993). While the approximation of the goals of justice in an environmental context is an interdisciplinary challenge (Walker, 2011), there are many normative approaches from other disciplines which can be used. For our clarification of ecological justice, we refer to the philosophical approach of Leist (2005). Leist differentiates between environmental and ecological justice: while environmental justice is rather in line with anthropocentrism and consequently reflected in many social and environmental dimensions as well as the evaluation of disagreements between both of these (Walker, 2011), ecological justice is the broader construct that does not only focus on humans (Leist, 2005). Leist (2007) understands ecological justice as distributive justice, whereby the objects to be distributed are related to nature. This leads to a difficult classification of ecological justice in the entire field of justice. In this context, Leist (2007) refers to three dimensions in the use of nature, including the human handling of natural resources: (1) the sustainable use of material resources as far as they can be replaced easily (e.g., energy), (2) the sustainable use of material resources as far as they apply to human rights (e.g., clean water) or the suffering of animals, and (3) the sustainable use of landscapes, biodiversity, or natural monuments. From these dimensions, he deduces three central issues of ecological justice: ecological equality of opportunities, ecological human rights, and the right to partake in the shaping of the environment. While the first two aspects refer to the distribution of material resources (e.g., valuable commodities) and ecological minimum standards (e.g., a healthy and hazard-free environment), the third one implicates ecological and aesthetical participation. The last aspect has less priority than the first. However, when all three aspects are fulfilled, ecological justice prevails (Leist, 2007). According to Leist (2007), this means that a social condition can be seen as ecologically just when:

(1) everyone has the same access to scarce environmental goods (ecological equality of opportunities),
(2) morally founded rights in consideration of critical goods are fulfilled (ecological human rights) and, at the same time,
(3) the modification of the environment complies with the ecological and aesthetical standards of the community (right to partake in the shaping of the environment).

This definition of ecological justice should reinforce the conceptualization of the EBJW. We expect that this new construct correlates negatively with pro-environmental behavior. More precisely, the EBJW might inhibit energy-saving behavior because, on the one hand, if people perceive the general situation as ecologically just, there may be no reason for action to save energy, especially when this is connected with personal limitations or costs. On the other hand, if people perceive an injustice but they do not feel they have any possibility to reduce it, a person with a high EBJW may feel a threat to his or her belief. Consequently, they have to deny this injustice, and so, there is again no need for action.

There are other theories that deal with the question of why people do not engage in behavior to reduce injustices, notably system justification theory and the theory of belief in a just world. Both theories offer similar explanations to the phenomenon. According to Kay and Jost (2003), in both system justification theory and belief in a just world theory, there is an inclination to perceive social conditions as fair, beneficial and legitimate, and it happens without conscious awareness. With specific regard to system justification theory, this perception is related to the social system, and it can not be restricted to the individual, in terms of ego justification, or the group, in terms of group justification (Kay, Jimenez, & Jost, 2002). It is noteworthy that not only the desire for personal control or justice motivates system justification (Kay & Jost, 2003) but people also aim to protect the status quo and justify the system. One reason for this can be seen in the need and desire to feel safe and to avoid negative feelings when observing injustice (Jost et al., 2010). Indeed, there are positive effects for individuals, e.g., the reduction of fear in the short term, but the consequences provoke harm in the long term, particularly for disadvantaged people within the system (Feygina, Jost, & Goldsmith, 2010). And, also related to environmental concerns, there is evidence that system justification tendencies have a negative effect on the willingness to behave in a pro-environmental way. Feygina et al. (2010) found that individuals show less readiness for environmental protection and even deny ecological problems when system justification tendencies are strongly pronounced. Yet, they also found that system justification does not inevitably mean a lack in pro-environmental actions and denial of the problems, when it is possible to see environmental protection as a way of preserving the social system as well as the status quo to invoke pro-environmental behavior. But one very important point is that system justification tends to promote the avoidance of explicit estimations of the environmental damage caused by the socioeconomic status quo, which protects people from dissatisfaction. Thus, people with high engagement in system justification, who are interested in maintaining the status quo, tend to ignore or deny environmental problems (Feygina et al., 2010).

Another theoretical basis for explaining inaction even though there is injustice can be found in the theory of the belief in a just world (Lerner, 1980). The idea of this construct goes back to Melvin Lerner (Lerner, 1965, 1980), who states that people are generally inclined to believe that the world is just and to look ahead with trust and confidence (Dalbert, 1996). It works in a very similar way to system justification: people want to feel safe, they desire stability concerning the system or the world they are living in. The BJW is connected to the conviction to live in a world in which everyone gets what he/she deserves and deserves what he/she gets (Schmitt, 1993). This belief can be shattered, for example by observing severe examples of experienced injustice, which, in some cases, leads to the reduction of prosocial behavior in various contexts.

The first instrument measuring the belief in a just world was the scale of Rubin and Peplau (1973, 1975), which has been used in more than one hundred studies (Furnham, 2003; Maes, Tarnai, & Schuster, 2012). There have also been suggestions to measure a context- (or domain-) specific BJW (Dalbert & Stöber, 2006; Schneider, 1988). Besides, Maes (1992) presented a multidimensional interpretation of the BJW in four dimensions: amongst others, the belief in an unjust world, which is a very interesting construct as it is not quite the opposite of the belief in a just world. Instead, it is a self-contained construct with a motivational structure of its own (Maes, 1992). Nevertheless, there are a number of difficulties surrounding the specification of the BJW in particular domains. According to Dalbert (1996), mostly, domain-specific justice beliefs are measured rather than the actual belief in a just world in a particular area. Moreover, the specification of a certain domain can only be seen as useful if the domain-specific just-world belief could lead to a better prediction of the behavior than the general belief in a just world (Dalbert, 1996).

Thus, a new construct has to differ sufficiently from the existing BJW scales. The EBJW is not a belief in a just world in a specific area, i.e., the ecological environment. To ensure this, the EBJW includes a very different item formulation, according to its conceptualization. The foundation of the concept is a normative approach to justice; accordingly, different conditions of ecological justice can be distinguished. Furthermore, one important aspect that distinguishes the EBJW is its focus on equality: we have come to the decision to focus more on the distributive aspect in terms of equality—everyone has the same chance and the same right to attain ecological goods. That is also because the definition of Leist (2007), which is at the basis of this newly developed construct, suggests that ecological justice implies this kind of equality. At the same time, this is addressed by the fact that we distance ourselves from a personally attributed notion of deserving; accordingly, when observing the ecological belief in a just world, it is different from domain-specific beliefs in a just world or even from a belief in a just world in a specific area.

The two theories, system justification and BJW, include descriptions of individuals' dispositions which explain why people fail to behave in a certain way. People believe devoutly that something is fair and that no need for action exists, so they aim to preserve the condition (Kay & Jost, 2003). However, when people observe injustice and become aware of it, this belief is threatened. To maintain this belief, two strategies exist: the restoration of justice, e.g., helping the

victim directly, or the cognitive reinterpretation of the fate as if it was deserved (Lerner, 1980). Either the victim itself is blamed for the event or the victim is depreciated by attributing negative character traits, i.e., secondary victimization occurs (Dalbert, 2010). In this context, the BJW also seems to be related to the justification of the status quo (Hafer & Choma, 2009).

Focusing on environmental problems, which are mostly quite enormous, the behavior of a single person normally does not cause any observable improvement, and if it does, it is negligible. This is due to the fact that, when environmental justice is considered as a global demand, it inevitably poses problems, such as climate change and the degradation of the environment, which cannot be solved easily and can be seen as fatal problems (Kazdin, 2009). The shared harms or risks are neither regionally nor temporally restricted, and consequently, people who have not caused this degradation or have not ultimately benefited from the process are the ones who suffer from the consequences (Pawlik, 1991). The underlying mechanisms are described in the concept of the Tragedy of the Commons (Hardin, 1968). Environmental protection is often connected with relinquishment and personal limitations, but the ecological benefit arises with delay (Nerb, Spada, & Ernst, 1997). Pollution is primarily connected with individual short-term profits and societies' long-term adverse effects, whereas environmental protection is linked to personal costs (Ernst & Spada, 1993). This shifting of costs and benefits is a crucial topic of psychological justice research in the environmental context (Clayton, 1996). The allocation of resources and hazards (Skitka & Tetlock, 1992; van Dijk, Engelen, van Leeuwen, Monden, & Sluijter, 1999) is consequently a central aspect of environmental justice (Walker, 2011).

While it lies in the nature of environmental problems that individuals cannot shield themselves from their consequences altogether, the BJW works to that effect by having an inhibitive effect on environmental behavior just like system justification (e.g., Feygina et al., 2010). There are findings which indicate that the belief in a just world has an indirect negative effect on pro-environmental behavior because it is linked to skepticism about global warming. Feinberg and Willer (2011) found that appeals to reduce the carbon footprint lead to a decrement of carbon reduction when BJW is highly developed. Nevertheless, the question arises whether existing concepts can tackle this problem. Even though they have a reference to the environment, there is something different that can be seen as the central point—in the case of BJW, it is the world as a place where everyone gets what he/she deserves; in the case of system justification, there is a system built by humans which is defended. The results of a Swiss study have shown that, in the context of the environment, neither the general nor the personal belief in a just world is able to improve the prediction of environmental behavior when variables from the theory of planned behavior (TPB) are used at the same time (Kaiser & Scheuthle, 2003). We suggest that besides BJW and system justification there is a conviction of ecological justice which influences human behavior. This might possess certain resemblances and analogies to the former; nevertheless, it is a different and self-contained concept. Its operationalization has been conducted along the lines of already existing scales for measuring the general BJW (Maes, 1992; Montada, Schmitt, &

Dalbert, 1983) as well as scales for measuring domain-specific BJWs (Dalbert & Stöber, 2002).

However, similarities between the EBJW and BJW can be seen. Related to both is the central role of distributive justice, whereas the main difference consists in the point of reference: with BJW, the focus is on what individuals deserve—which can even diverge, depending on what share is attributed to people. The EBJW, on the other hand, is focused on the resources and their equal distribution amongst all people—in other words, equality. But also EBJW and system justification seem to work in similar way. As argued before, system justification is connected with the maintenance of the status quo, even if this status quo leads to environmental problems. So people may not reflect about it and consequently ignore or deny environmental damage (Feygina et al., 2010). This might also be one important point to be considered concerning the EBJW.

The Motivational Base of Environmental Behavior

It is necessary to recognize what crucial motives and goals determine the behavior of individual citizens by attaining a responsible and sustainable handling of the environment (Gifford, 2007). Accordingly, we focus on models which concentrate on individual motives. Within the research field of environmental psychology, many models aiming to explain environmentally relevant behavior have been developed (Müller, 2012). Some of these relate to environmentally significant behavior, including activities with all kinds of environmental outcomes, others just relate to pro-environmental behavior and only include activities with beneficial environmental consequences which can be seen as desirable behavior (Stern, 2011). The two categories of behavioral criteria regarded in the various models—pro-environmental behavior and environmentally risky behavior—do not exclude one another. A model that connects both of them is the model of environment-related action by Montada and Kals (2000), which lies at the basis of the present study. In formulating the model, the authors draw on existing models that are prominent in the field of applied social psychology. On the one hand, it is the TPB developed from the theory of reasoned action, which can be seen as one of the dominant models used within environmental psychology and which is the background for the model of environment-related action (Ajzen, 1991; Ajzen & Fishbein, 1980). Noteworthily, the applications the TPB that seem to be especially successful take the specifics of environmentally relevant behavior into account, which is mainly a justice and responsibility perspective. On the other hand, the environmentally specific norm activation model (Schwartz, 1977; Schwartz & Howard, 1981) and the value-belief-norm theory (Stern, 2000), with the underlying assumption that the protection of the global environment is a very complex task and that pro-environmental behavior nearly always implies greater costs than profits for the acting individual, serve as a foundation. Consequently, there may be reasons other than selfish motives that induce this kind of behavior (Stern, 2011), motives such as moral values or personal norms, feelings of moral obligation or the assumption of responsibility.

Getting back to the model of environment-related action by Montada and Kals (2000), the criterion involves, among others, willingness for continued commitment, which has proved to be a valid predictor of manifest behavior in longitudinal studies (Montada, Kals, & Becker, 2007). In contrast to Ajzen's intention construct, the willingness for continued commitments does not refer to a single act but to basic commitments to promote the aims in question dependent on one's own situational circumstances (e.g., time slots). The model also embraces justice appraisals (Montada & Kals, 2000), which are measured as a subjective perception in two different ways: first, with regard to the perceived justice of environmental distribution of profits and risks, and second, pertaining to policy measures against pollution and the utilization and exhaustion of the environment. With regard to this model, not only pro-environmental behavior can be explained and predicted by environment-related cognitions like the previously mentioned appraisals of justice, appraisals of responsibility, control beliefs, and the awareness of ecological risks (Syme et al., 2006), but also by responsibility-related emotions like outrage about insufficient environmental protection versus anger about excessive environmental protection and its negative side effects, as well as emotional affinity toward nature (Kals & Müller, 2012). Besides these moral variables, the model encompasses emotional affinity toward nature as a powerful predictor contrasting with the lack of influence of other emotions, like fear, and personal burdens related to the natural environment which do not have any influence on the personal engagement for global environmental protection, like the experiencing of ecological pollution in one's own environment. In sum, there is evidence that environmental cognitions in terms of the attribution of responsibility become central when explaining behavioral decisions and commitment for global environmental protection. But besides this, also emotional predictors are very important, whereby these relevant emotions can be seen as emotional indicators for the attribution of responsibility.

In contrast, behavior that has a potentially negative impact on the environment because it pursues goals that contradict with environmental protection can generally be explained by the same set of predictors but with reversed prediction weights. It could be shown that perceived injustice of the present depletion and environmental pollution motivates willingness for continued commitment to save global commons (Montada & Kals, 2000). In further studies, the perceived justice of political measures has been examined (Clayton & Myers, 2009; Ittner & Ohl, 2012; Montada & Kals, 1995; Syme et al., 2006) and the significant influence on environmentally relevant behavior can be confirmed (Clayton, 2000; Ittner & Montada, 2009; Kals et al., 2006; Opotow & Clayton, 1994). In addition, in the context of climate protection, it has been found that the perception of inter-generational injustice raises the willingness to commit oneself to climate protection, or rather the reduction of carbon dioxide emissions (Kals & Russell, 2001).

In sum, it can be assumed that the motivational basis of environmentally relevant behavior is multi-causal. There are various constructs that seem to be involved, but it can be stated that cognitive and affective responsibility and justice motives play an essential role in explaining environmentally relevant behavior.

The described model of environment-related action is used as a basis for the present study but is extended by the new construct EBJW and the transfer to the

energy context. Some scales have been omitted, such as the emotional affinity toward nature, as they were not in the focus of interest in the present study, while other scales have been added, such as the justification arguments, which can been found in the Schwartz model (1977), or existential guilt, which derives from the approach of Montada and Reichle (1983). As it is the prior aim of the present paper to exam the EBJW, these extensions will not be the focus of the present paper.

This initial model belongs to environmentally specific models but is also influenced by general social psychological models (Ajzen, 1991; Ajzen & Fishbein, 1980) and related to other environmentally specific models (Schwartz, 1977; Schwartz & Howard, 1981; Stern, 2000). There are a couple of specific characteristics of the model presented here: first, both categories of behavior are included (pro-environmental as well as environmentally risky behavior) on the level of commitments as valid proxies of the behavior. In the present case, it is willingness for pro-environmental behavior referring to the disposition to buy new, energy-saving equipment, e.g., to pay attention to a low CO_2 emission when buying a car, but also the willingness to engage for goals that contradict energy conservation, e.g., the abolition of the prevailing car tax. Furthermore, various responsibility- and justice-related variables, such as control beliefs and justification arguments, are included. The control beliefs implicate that someone feels confident to show a specific action (internal control belief), in this case to reduce environmental problems by doing something against it, or perceives that others are able to do this (external control belief). Justification arguments are reasons given for refraining from doing something—in terms of the denegation of responsibility, in the current case, responsibility is applied to measures to save energy. All of these contribute to explain pro-environmental behavior as well as environmentally risky behavior. Decisions for environmentally relevant behavior are not only based on cognitive processes but also include emotions as important factors. Variables of responsibility and justice are not only involved as cognitions but also as emotions, such as anger and outrage. The model, therefore, includes indignation about insufficient furtherance of economic and social interests as well as indignation about insufficient energy protection. As an opposing emotion, and because of its primarily internal focus, existential guilt, in terms of feeling guilty compared to other people regarding existential goods, has been included.

Research Questions and Hypotheses

The present study mainly addresses the question whether the development of the new EBJW scale has succeeded, what relationships between EBJW and existing constructs can be proven, and whether it can be integrated within the model as a new predictor. Therefore, it will be examined if there are differences between the participants concerning a construct that includes the assumption of ecological justice in the world and whether its validity can be confirmed. This will be done in the context of energy-saving behavior. We think that it is possible to convert the normative construct of Leist (2007) into a psychologically measurable construct that

covers the three aspects of Leist's ecological justice. This leads to the first hypothesis:

Hypothesis 1 *The construct of EBJW can be operationalized and scale analyses will prove the validity of this new scale.*

In their study on belief in a just world, Schmitt et al. (2008) analyzed the distribution of the general belief in a just world in the German population. In the total population of adults, the general BJW amounted to $M = 2.84$; $SD = 1.00$ (1 = maximal renunciation; 6 = maximal agreement), but varies among socio-demographic variables like age, sex, derivation, and education. The age seems to play a crucial role: In accordance with our results, also Dalbert, Montada, and Schmitt (1987) found no correlation between sex or education and BJW, albeit between age and BJW. With regard to their findings, the BJW increases with age in the way that older people are assumed to have a greater BJW. Hence, there is evidence that the BJW varies with age, and especially school education has a big influence on its occurrence (Schmitt et al., 2008). The authors could also identify an expected relationship between BJW and self-deception by measuring socially desirable responding with a scale of Fahrenberg, Hampel, and Selg (1984) (Dalbert et al., 1987). While socio-demographic variables can provide enlightening evidence (Abrahamse & Steg, 2009), we aim to examine these relationships in the context of the EBJW and formulate the following second hypothesis:

Hypothesis 2 *There are significant correlations between participants' EBJW occurrence and socio-demographic variables in the way that older participants have a higher EBJW than younger people and that a higher educational achievement leads to a lower EBJW.*

The EBJW construct has to be validated using criteria groups. Members of car- and motoring-clubs have a tendency to show behavior that is in conflict with environmental protection, e.g., going for a ride on their motorbikes. Therefore, a lower ecological awareness is expected in order to avoid unpleasant feelings of cognitive dissonance. In contrast, members of environmental organizations already engage in protective behavior for the sake of the environment. Focusing on their engagements would strengthen their ecological awareness and their belief that such engagement is necessary and vice versa. Previous studies have already provided empirical evidence for such differences between the groups in criteria group validation (Montada et al., 2007). Hence, the third hypothesis is:

Hypothesis 3 *There are significant differences between members of criteria groups with regard to their EBJW in such a way that car- and motoring-club members have a more strongly pronounced EBJW than members of environmental groups.*

The model has already been validated in many different contexts (cf. Kals & Russell, 2001; Montada & Kals, 2000). Thus, one can assume significant relationships between the validated norm-relevant constructs and the newly developed EBJW. This leads to hypothesis four:

Hypothesis 4 *There should be correlative findings with other responsibility- and justice-related variables of the model which give information about the disposition of the EBJW.*

The particular accomplishment of the model is the explanation and prediction of environment-relevant behavior and commitment by environment-related cognitions and emotions. This leads to the next hypothesis:

Hypothesis 5 *We assume that, together with other energy-relevant variables, the EBJW is a powerful predictor for energy-relevant behavior, such as energy protection, but also for behavior that contradicts with energy protection.*

Finally, while it is assumed that the new concept has a dispositional character, we suggest that there might be mediator effects from the predictors relating to the EBJW. Thus, the last hypothesis is:

Hypothesis 6 *We suggest that cognitive and affective appraisals of justice act as a mediator on EBJW when explaining environmental behavior.*

Method

Measuring Instrument

To validate the hypotheses, a questionnaire study has been carried out to test the newly conceptualized and developed scale. The methodology is presented in the following. The questionnaire encompassed 13 pages and required approximately 20 min to be completed. All the scales had the same response format: six-point Likert scales with response options from 1 = "applies not at all" to 6 = "applies absolutely."

At the end of the questionnaire, questions on social desirability, socio-demographic variables like age, highest educational achievement, current profession, and financial situation were asked. These questions deviated from the six-point response format. For the measurement of social desirability, the inventory of Musch, Brockhaus, and Bröder (2002) was used for the assessment of two factors of socially desirable responding, including self-deceptive enhancement and impression management. There was no relevant correlation between criteria variables and social desirability ($-.06 \leq r \leq -.07$; n.s.). Only the commitment to goals that contradict energy conservation had a small but significant correlation with self-deceptive enhancement ($r = .17^{**}$), but partial correlations showed that this had no influence on the correlations between this criterion variable and the other variables, e.g., the EBJW. Furthermore, within the regression analysis, self-deceptive enhancement could not qualify as a predictor at all.

The formerly validated scales (Kals & Russell, 2001; Montada & Kals, 2000; Montada et al., 1983) encompassed various measurements of the different cognitions and emotions in the context of energy behavior which were mentioned in the hypotheses.

The internal control belief scale consisted of three items ($\alpha = .75$). The instructions on this scale included the following question: "Who can effectively do something to reduce environmental burden and counteract climate change?" (Item example, referring to "Who has an influence on reducing environmental burden?": "…myself, by choosing an electricity provider which offers electricity gained from renewable energy"). The justification argument scale included six items ($\alpha = .83$) which implicate that it is not our responsibility to take further measures to reduce energy consumption due to false pretenses, e.g., "because there are more important things."

The emotional scales included indignation and guilt. Indignation about insufficient furtherance of economic and social interests comprised four items ($\alpha = .79$) (example: "I am angry when reduced energy consumption comes along with losses in living standard"). The opposing indignation about insufficient energy saving was also measured with four items ($\alpha = .74$, example: "I am annoyed when politicians in charge do little to reduce the energy consumption in Germany"). The last emotion scale was existential guilt, which included four items ($\alpha = .91$, example: "In the light of the increase in natural disasters, I feel guilty when I compare my own living conditions with those of humans in developing countries").

Besides this, energy-relevant behavioral commitments and willingness were measured. The commitment to goals that contradict energy conservation was investigated with eight items ($\alpha = 84$). One sample item was: "I am basically willing to get involved with employee associations which advocate the extension of the subsidization of hard coal production for the preservation of jobs." In addition, the willingness to buy new, energy-saving equipment was included with five items ($\alpha = .79$, example: "In general, I am willing to purchase new equipment that consumes less energy, even if it is more expensive").

The newly developed scale to measure the EBJW came second. As argued before, the scale had been developed similarly to existent just-world scales and by integrating Leist's (2007) definition of ecological justice. For each of the three aspects of ecological justice according to Leist, three items had been formulated, two in a positive direction, and in each case one negative item measuring the belief in ecological injustice. Altogether, the scale encompassed nine items. Even though the application of negatively formulated items in the just-world context is controversial (Schmitt et al., 2008), they can not simply be seen as the opposite of the positive items or rather the other end of an uni-dimensional scale (Maes, 1998a). Indeed, in the course of developing the measuring instrument by Dalbert et al. (1987), the use of injustice items was given up. However, it might be interesting whether this one-dimensionality also applies to the belief in an ecologically just world. If so, these negative items should give information about this.

Participants

Altogether, 312 people ranging from age 16 to 86 (40.2 ± 18.0) participated in the study (156 males; 153 females; 3 missing). Particularly, 87 participants (61 males; 26 females) declared to be members of a car- or motoring-club and 90 (54 males; 36

females) members of environmental organizations, though not all of them engaged in their respective organization and some were just passive paying members. This was particularly true for the members of the ADAC (the German automobile club), as in Germany nearly every car driver is a member of it. It occurred that 23 participants declared double membership in both an environmental organization and a motoring-club but these were all passive ADAC members with additional engagement in environmental groups. Most of the participants were not affected by environmental burdens such as air pollution (87 %), bad water quality (87 %), or forces of nature (88 %). Perceived burdens by industrial facilities were very low in the sample (13 %). Only excessive noise was declared to be bothering some of the participants (30 %), and 33 % of the participants stated to obtain electricity from renewable energy. Altogether, 20 % used a solar heating system and 18 % a photovoltaic system due to reasons of climate protection, whereas, overall, 10 % of the total sample used both systems. The participant's education ranged from the German "Hauptschule" (a certificate of secondary education) to university degrees, but also participants with the German "Realschule" (general certificate of secondary education), the German "Abitur" (university-entrance diploma, equivalent to a high-school diploma), and polytechnic degrees were in the sample. However, people with higher education were slightly more represented than those with lower; 38 % of the participants stated to hold a university or polytechnic degree.

Procedure

From November 2011 until February 2012, the data collection via questionnaire took place. It was conducted online and also as a classic paper–pencil version. The two versions were identical. They did not differ in response format, page break or the sequence of the questions and, of course, also the questions and instructions were exactly the same. The only difference between the two versions was the way of data collection. This was because we aimed to include as many participants as possible, on the one hand by using an online version to benefit from the possibility of spreading the questionnaire via the internet, and on the other hand by using the paper–pencil version to also reach people who have no access to the internet, such as elderly people (to recruit the elderly people, partially, we cooperated with the nursing staff of old-age homes). Accordingly, the particular samples differed very strongly from each other, especially concerning age, and consequently they could not be compared. Nevertheless, we assume that the two versions are comparable due to the above-named reasons. The link to the online version was spread by circular mail, press reports and by linkage on the homepage of the university. For the recruiting of the criteria groups, diverse internet platforms were used in a target-oriented way, such as car and motoring forums or environment- and energy-related forums. As mentioned before, the paper–pencil version was used primarily to reach people without access to the internet, but also for the systematic recruitment of the criteria groups. Both ways of data collection were unsupervised. The participants had to fill out the questionnaire alone but we gave very precise instructions at the beginning.

Results

Validation of the New Scale

As described before, the EBJW encompasses nine items. The exploratory factor analysis demonstrated that the scale provides, under the extraction criterion "eigenvalue smaller than one," a three-factorial result of the factor analysis. Actually it became apparent that the originally negatively formulated items did obtain a negative loading on the same factor but opened two new factors. In contrast, enforcing a one-factorial solution involved no significant factor loading of the three negative items and a very unsatisfying explanation of the variance. However, when enforcing a two-factorial solution that seemed to be the most obvious solution with regard to the scree-plot, the distinction between negative and positive items still existed. This was concordant with the results from implied evidence by Maes (1998a) to a belief in an unjust world. With regard to the content, the solution with two enforced factors was chosen, whereby 40.34 per cent of the items' total variance could be explained. The first factor consisted of the six positively formulated items. These six items possess satisfying validity of Cronbach's $\alpha = .80$ and were aggregated to the EBJW scale. The negatively formulated items, which all loaded on the second factor, invariably showed very heterogeneous factor loadings and very small reliability ($\alpha = .48$). The three items were thus used as single items for the continuing analyses. The documentation of the factor analysis can be seen in Table 1.

The results from the descriptive analysis showed that the EBJW in the total sample was at a very low level ($M = 2.11$; SD = .94) and lay clearly below the scale's mean value of 3.5 ($t = -26.06$; df = 310; $p < 0.01$). This implies that the total sample, by tendency, considered our world not to be ecologically just. Even though the mean value was not very high, the standard deviation of .94 in the aggregated scale reflected that some of the participants thought the world is ecologically just or even had a more strongly pronounced belief that it is just than others. Nevertheless, the low occurrence also accompanied a skewness of 1.48, which indicated a left-skewed distribution, and a kurtosis of 2.48. In Table 1, the item and scale analysis can be seen in detail. The presented table is the result of a translation/back-translation technique because the original scale was in German. So, referring to Cha, Kim, and Erlen (2007), we translated the scale into English. Then, a bilingual native speaker translated it back into German—without knowing the original scale—and after that, the original and the back-translated version were compared.

Item number three, one, and nine display the ecological equality of opportunities. Item four, seven, and six represent the ecological human rights, and finally, item five, eight, and two refer to the right to partake in the shaping of the environment.

In contrast to the positive items, the negative ones had a general tendency of accordance. The item including *belief in an unjust world concerning ecological human rights* had a fairly high acceptance. Whereas the item *belief in an unjust world with regard to the ecological equality of opportunities* and the item including

Table 1 Item and scale analysis of the ecological belief in a just world scale ($311 \leq N \leq 312$; extraction criterion: number of factors = 2)

Item number	Item wording	*M*	*SD*	r_{it}	h^2	*l*1	*l*2
EBJW 3	When valuable environmental resources are distributed, everyone has the same chances to acquire them	1.72	1.30	.66	.62	**.79**	.03
EBJW 4	Overall, everyone can rely on having access to a healthy and hazard-free environment (e.g., unpolluted soils)	1.82	1.21	.64	.55	**.74**	−.06
EBJW 7	By and large, everyone has the same opportunity to acquire natural assets (e.g., soil resources)	1.59	.98	.63	.54	**.72**	−.14
EBJW 5	Everyone can participate in the shaping of his/her environment (e.g., in decisions about the siting of industrial facilities)	2.57	1.43	.59	.42	**.61**	−.20
EBJW 1	Altogether, related to nature, everyone gets what he/she deserves	2.16	1.56	.51	.37	**.61**	−.00
EBJW 8	Everyone has various possibilities to participate in the shaping of the natural environment (e.g., in decisions about the construction of a landfill site)	2.78	1.40	.41	.19	**.43**	−.10
EBJW 6	In matters of the natural environment, injustices happen to many people (e.g., polluted air)	5.15	1.17	–	.65	−.07	**.80**
EBJW 9	Many people are refused the chance to consume scarce resources (e.g., energy carriers like mineral oil)	4.85	1.31	–	.23	−.16	**.45**
EBJW 2	Everyone has to expect that an unjust fate will happen to him in decisions concerning the environment (e.g., the destruction of local nature)	4.27	1.51	–	.07	.01	.26

Factor loadings ≥ .40 are highlighted in bold

M mean, *SD* standard deviation, r_{it} discriminatory power, h^2 commonalities, *l* factor loadings

the *belief in an unjust world concerning the right to partake in the shaping of the environment* had a slightly lower compliance.

Nevertheless, the focus for further analysis was on the scale encompassing the six positive items. This was because the empirical circumstances made a good case for treating them differently from the negative ones, as the factor analyses have showed. Also the correlations between the negatively and the positively formulated items confirmed this proposition. The item named *belief in an unjust world concerning the right to partake in the shaping of the environment* did not correlate with the aggregated EBJW scale at all ($r = -.02$; $p =$ n.s). In contrast, the item *belief in an unjust world concerning ecological human rights* showed a very small but significant negative correlation ($r = -.15$; $p < 0.01$) with the EBJW, just as well as the *belief in an unjust world with regard to the ecological equality of opportunities*, which also correlated with it ($r = -.19$; $p < 0.01$). Also with regard to the contents, there were indications for handling them as something different. Maybe the perception was different because the positively formulated items represented the

desirable standard, i.e., the target state, whereas the negative items could be seen as a salient deviance from normal conditions. In addition, the wording was different: while the positive items were formulated more generally with terms like "everyone," the negative ones included much more specific wordings like "many people." Thus, it seems to have been more difficult to agree with the positive items because one available counterexample was enough to reject it. The cognitive mechanisms when responding to the negative items were different because several examples for rejecting the item had to be found systematically. Considering content and formulation, the positive and the negative items differed from each other in terms of the degree of generality. Finally, there were methodological as well as linguistic indications for treating positive and negative items differently.

This is why the scale consisting of the six positive items was used as the EBJW scale without the negative items. Moreover, it might be interesting to examine which other variables may have an influence on the EBJW.

The EBJW and Socio-Demographic Variables

While research on the general BJW provides an informative basis for the relevance of socio-demographic variables, we also examined possible correlations among age, sex, and the EBJW. First of all, the sample was paralleled according to age: participants younger than 40 and older than 40 were assigned to two separate groups.

This procedure was chosen because of the consistency of the sample: by tendency, younger participants in the study had higher educational achievements than the older ones. To counteract this, participants were paralleled along their socio-demographic variables. Therefore, a one-to-one allocation was carried out with relevant variables, that is sex and educational achievement. The distribution of these two was kept as equal as possible in each group. Other factors were not considered. Each paralleled sample included 110 participants. The mean value of the EBJW scale in this partial sample stayed nearly the same ($M = 2.12$), only the standard deviation increased a little (SD = 1.00). The two groups, participants older than 40 and those younger than 40, had the same size ($n = 110$). In each group, there were 56 women and 53 men. Also the educational achievements were comparable. The average age in the younger group was 24.95 (SD = 5.29) while they ranked from 16 to 39, in the older group 54.82 (SD = 10.53) with a range from 40 to 83.

A correlation between the EBJW and social desirability was found as well, but only for self-deception ($r = .17$; $p < 0.01$). However, partial correlation showed that this did not influence the correlations with socio-demographic variables (Table 2). Furthermore, a t test ($t = 6.06$; df = 204.33; $p < .01$) confirmed that older participants in the sample had a higher EBJW ($M = 2.29$; SD = 1.11) than participants younger than 40 ($M = 1.94$; SD = .85). The effect size ($d = .36$) was in the middle range.

The results also suggest that the EBJW is indeed correlated with sex and educational achievement in the present sample. The negative correlation indicates that male participants had a higher EBJW than female ones (coded with 0 = male; 1 = female). Furthermore, with the increase of educational achievement, the EBJW decreased, so there was also a negative correlation between them (as lower

Table 2 Bivariate and partial correlation (social desirability has been residualized) between the *EBJW* and socio-demographic variables ($N = 220$)

	Correlations with the EBJW	
	Bivariate	Partial
Age	.24**	.21**
Sex	−.22**	−.20**
Educational achievement	−.18**	−.18**

** $p \leq .01$; * $p \leq .05$

education was coded with a lower number than the higher one). We recognize with regard to the present parallelized partial sample that the EBJW was more strongly pronounced in older participants than in younger ones and that sex and educational achievement also were related to the occurrence of the EBJW. However, this is just a tendency and it is not possible to draw general conclusions because of the relatively small sample size.

Criteria Group Validation

For further validation of the new construct, it should also be clarified if the hypothesized difference between members of criteria groups exists. It was assumed that membership in an environmental protection organization leads to a more skeptical perception of the world as ecologically just.

There were 87 participants in the total sample which stated to be a member in a car- and motoring-club, and furthermore, there were 90 participants in environment protection organizations. To test the strength of their commitment, they could rate on a six-point rating scale how they estimated their own commitment in comparison with other members of their organization. The scale ranged from very low to very intense. 61 members of the car- and motoring-clubs estimated their engagement as low or very low and were therefore seen as passive members. The main reason for this is the high quotient of passive ADAC (the German automobile club) members. As already mentioned, in Germany, the ADAC is a club for everyone who owns a car, and offers widespread supply of help in case of an accident. Due to its benefits, most of the German car owners are members of it. That is why they could not be used for further analysis. In the end, the total number of active participants was 33 members.

In contrast, the share of active environmental activists was much higher. To examine the supposition of a higher EBJW in environmental activists, a t-test for independent samples was performed. Therefore, passive members were excluded, and once again, a parallelization was conducted along the criteria of age, sex, and educational achievement to obtain two groups with equal sample size. Here again, the one-to-one allocation was chosen, entirely independent from other variables.

The parallelized groups included 33 people in each case. As the mean age in the car- and motoring-group was very high ($M = 53.32$; SD = 18.66), the average age of the environmental group was also higher than before ($M = 51.12$; SD = 17.05) and came along with the parallelization between all concerning age. Each group contained five women and 28 men. The educational achievements ranged, in both groups, from secondary education to university degree.

T-tests revealed differences between members of environmental organizations and other participants, especially members of other organizations such as car- and motoring-clubs ($t = 2.29$; df = 57.29; $p < 0.05$). Members of environmental organizations had a lower EBJW ($M = 1.92$; SD = .71), and in contrast, members of car- and motoring-clubs believed that a condition of ecological fairness exists in the world ($M = 2.42$; SD = 1.01). Certainly, the average value is still small, which once again illustrates that the sample was collectively very susceptive to environmental topics. Nevertheless, there was an effect with medium effect size ($d = .59$).

Relationships with Existent Constructs

As the EBJW is entirely new, there is no evidence about its relationship to established psychological constructs. Bivariate correlation analyses were performed to find out what the EBJW is and how it should be classified. The correlation between the EBJW and the commitment for goals that contradict energy conservation was $-.23$ ($p < 0.01$), while there was no significant correlation between this criterion and the belief in an unjust world concerning the ecological right to modify a legal relationship. However, a correlation existed between the belief in an unjust world concerning ecological human rights ($r = .19$; $p < 0.01$) as well as between the belief in an unjust world concerning the ecological right to modify a legal relationship ($r = .15$; $p < 0.01$) and the commitment to goals that contradict energy conservation. With regard to the willingness to buy new, energy-saving equipment, the EBJW correlated with $-.42$ ($p < 0.01$), but the three negative items did not correlate at all.

Correlations between environment-related emotions and cognitions are more instructive and have already been proven as meaningful in psychological justice research on environmental issues. Table 3 shows the correlations among measures of cognitive and affective appraisals of justice and the EBJW as well as the negatively formulated items.

The results show that outrage about insufficient furtherance of economic and social interests (i.e., limitation of personal freedom of decision, job cuts or losses in economic status) correlated with the EBJW at about $r = .27$ ($p < 0.01$). People who believe that the world is an ecologically just place report more indignation about inexistent support for social or economic needs. Surprisingly, no correlation could be found, neither negative nor otherwise, with the contrary emotion: indignation about insufficient furtherance of environment protection (in the case of the present study relating to saving energy).

Another even more momentous finding is the relationship between the EBJW and justification arguments. These two constructs correlated at .44 ($p < 0.01$) with each other. This justification argument included the denial of responsibility for antipollution and/or energy-saving measures. This justification of the status quo also means, in reverse, that the EBJW possesses, to some extent, a function of justification. This relationship still existed when social desirability, or more precisely self-deception, was partialed out. The correlation amounted to .42 ($p < 0.01$).

Table 3 Means, standard deviations, and intercorrelations between measures of cognitive and affective appraisals of justice and the ecological belief in a just world

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Ecological belief in a just world	1.00								
2. Belief in an unjust world concerning ecological human rights	−.15**	1.00							
3. Belief in an unjust world concerning the right to partake in the shaping of the environment	−.02	.22**	1.00						
4. Belief in an unjust world with regard to the ecological equality of opportunities	−.19**	.37**	.16**	1.00					
5. Indignation about insufficient furtherance of economic and social interests	.27**	−.00	.03	−.15**	1.00				
6. Indignation about insufficient energy protection	−.06	.25**	.08	.10	−.21**	1.00			
7. Existential guilt	−.11*	.26**	.12*	.14*	−.15**	.48**	1.00		
8. Internal control beliefs	−.08	.25**	.11	.01	−.22**	.48**	.40**	1.00	
9. Justification arguments	.44**	−.09	−.05	−.10	.54**	−.32**	−.20**	−.33**	1.00
M	2.11	5.14	4.27	4.85	2.85	4.97	3.78	5.12	2.41
SD	.94	1.17	1.51	1.31	1.17	.90	1.32	.95	1.15

$N = 310–312$

* $.01 < p < .05$, ** $p < .01$

Besides this, it is noteworthy that a common factor analysis across all the items of the measured scales listed in Table 3 represent the a priori mentioned constructs very well by separating them from each other. Under the extraction criterion "eigenvalue smaller than one," the result of the factor analysis provided eight

factors. With regard to the scree-plot, we enforced seven factors. In this seven-factorial solution, the six positive EBJW items build the second factor, while the three negative EBJW all together loaded on the last factor, but again with very unequal factor loadings. The other items loaded on the remaining factors. Referring to the theoretically founded supposition, congruent items which represented the same construct also loaded on the same factor in each case here. Accordingly, the discriminant validity could be seen as confirmed, and once again there was evidence that the negative EBJW items were distinct from the positive ones because even in this main factor analysis with all items they formed an own factor.

Multiple Findings About the EBJW and Environment-Relevant Behavior

We expected, in the fifth hypothesis, that the EBJW would qualify, together with other morally relevant cognitions as well as emotions of the model, as a predictor for environmentally relevant behavior. To test this hypothesis, stepwise multiple regression analyses with all of the independent variables were conducted on the criterion of the willingness to buy new, energy-saving equipment and on the commitment to goals that contradict energy conservation. The socio-demographic and control variables were not considered in the regression analyses. Within this method, the explaining variables entered into the equation stepwise, while preclusion and inclusion were tested in every step and refer to the *F*-likelihood in each case. This happened among a specific boundary value which indicated the criteria for preclusion or inclusion. The process continued as long as no further preclusion or inclusion of a variable was possible.

In line with the hypothesis, the results indicate that the EBJW was able to qualify as a significant predictor together with established constructs in both cases: first, within the stepwise multiple regression analysis of the willingness to buy new, energy-saving equipment. This form of pro-environmental behavior could be predicted altogether with an explained variance of 49 %. The most powerful predictor was the internal control belief as the conviction to be able to change the actual situation in a desired way by one's own behavior. While buying new equipment can be seen as a process on an individual level, this internal control belief seemed to be a crucial factor. Other relevant predictors which could explain this pro-environmental behavior were moral emotions: outrage about insufficient furtherance of economic and social interests, which had a negative predictive value in this context, but also indignation about insufficient energy protection and existential guilt. And last but not least, the EBJW emerged as a predictor for the willingness to buy new, energy-saving equipment (see Table 4). As expected, the EBJW had a negative value, and consequently, as the negative correlation indicated, it was characterized by a negative influence on the commitment, which conformed to previous findings about BJW (Dalbert, 1996; Hafer & Choma, 2009; Maes, 1998b).

A closer examination of the second regression analysis revealed that there were differential patterns of prediction which explained the difference in the various willingness criteria. This time, the predicted criterion was commitment for goals that contradict energy conservation and could be explained collectively by 38 % of

Table 4 Stepwise multiple regression analysis of the willingness to buy new, energy-saving equipment on the predictor set

Criterion	Predictor	R^2	ΔR^2	B	SE B	β	r
Willingness to buy new, energy-saving equipment	Internal control beliefs	.31	.31	.36**	.05	.32	.56
	Indignation about insufficient furtherance of economic and social interests	.42	.11	−.24**	.04	−.26	−.44
	Indignation about insufficient energy protection	.46	.05	.21**	.06	.17	.49
	Existential guilt	.48	.02	.12**	.04	.15	.43
	Ecological belief in a just world (EBJW)	.49	.01	−.11*	.05	−.10	−.23
Constant				2.14**	.32		

F_{total} (5/303) = 59.05**

* .01 < p < .05, ** p < .01

Table 5 Stepwise multiple regression analysis of commitment to goals that contradict energy conservation on the predictor set

Criterion	Predictor	R^2	ΔR^2	B	SE B	β	r
Commitment to goals that contradict energy conservation	Justification arguments	.29	.29	.25**	.05	.30	.54
	Indignation about insufficient furtherance of economic and social interests	.35	.06	.23**	.04	.28	.50
	Ecological belief in a just world (EBJW)	.38	.04	.22**	.05	.21	.42
Constant				.19	.14		

F_{total} (3/305) = 64.30**

* .01 < p < .05, ** p < .01

the criterion variance. The most powerful predictor in this context was the justification argument of denial of responsibility for energy-saving measures. Furthermore, indignation about insufficient furtherance of economic and social interests could contribute to the explanation of the variance. It is remarkable that the EBJW correlated with both constructs, especially with justification arguments and, at the same time, different parts of the variances could be explained by the three constructs (see Table 5). Again, this emphasized the differential pattern of criterion prediction. Moreover, it is notable that only predictors with positive regression weights qualified as significant in the equations.

But even though the EBJW qualified for explaining the willingness to buy new, energy-saving equipment as well as predicting commitment to goals that contradict energy conservation, the explained variance did not increase substantially when EBJW was added as a predictor. The additionally explained variance ranged from one to four percent. But, especially in the case of the second criterion, the correlative findings (r = .42**) suggest that there might be other effects which

reduce the direct influence of the EBJW on the criterion. Consequently, we assumed that the cognitive and affective appraisals of justice might mediate the effect of the EBJW on the commitment to goals that contradict energy conservation.

We therefore examined possible mediator effects. The independent variables of the first regression analysis (internal control beliefs, indignation about insufficient furtherance of economic and social interests, indignation about insufficient energy protection and existential guilt) were tested as possible mediators of the EBJW. There was a significant negative total effect of EBJW on the criterion willingness to buy new, energy-saving equipment ($\beta = -.25$, $p < 0.01$), but when the other variables were entered into the equation, this influence became smaller and less significant ($\beta = .11$, $p < 0.05$). A Sobel test (Sobel, 1982) yielded a significant mediation effect of indignation about insufficient furtherance of economic and social interests ($z = -.3.89$, $p < 0.01$). The model fit was $\chi^2 = 191.89$; df = 9; $p < 0.01$.

In addition, a mediator analysis was conducted in the regression analysis of the commitment to goals that contradict energy conservation on the variables of justification arguments, indignation about insufficient furtherance of economic and social interests, and the EBJW. Therefore, the three named variables were used as predictors, while justification arguments and the indignation were also used as mediators of the EBJW. The results show that there was a significant and positive total effect of EBJW on the commitment to goals that contradict energy conservation ($\beta = .42$, $p < 0.01$), and when considering the other variables, this beta weight dropped to .22 ($p < 0.01$). The Sobel test confirmed the significant mediation of the EBJW by justification arguments ($z = 4.96$, $p < 0.01$) as well as indignation about insufficient furtherance of economic and social interests ($z = 3.79, p < 0.01$). Hence, the direct as well as the indirect effects of the EBJW on the criterion was included. This pattern seemed meaningful because the EBJW was conceptualized as a disposition, while the other constructs implied a higher proximity to behavior. There is an acceptable model fit for this ($\chi^2 = 84.21$; df = 1; $p < 0.01$).

Finally, it could be assumed that cognitive as well as affective facets were involved in mediating the EBJW when predicting behavioral commitment and, consequently, the direct effects were substantially smaller.

Discussion and Conclusion

In the present research, we aimed to explore whether the EBJW can be measured and whether its validity can be confirmed. First, the new EBJW scale was developed based on the theoretical background. Then, the validity of the scale was examined using data from a questionnaire study in the context of energy conservation.

According to the first hypothesis, the findings suggest that the EBJW could be successfully operationalized, and that this scale shows meaningful connections with other constructs and significant differences between groups. It is possible to combine and embed a primarily normative construct of ecological justice in psychological research in terms of using it for the development and operationalization of the EBJW. In the course of scale construction, negative items were also

formulated. It could be proven by factor analysis that similar to the general BJW (Maes, 1998a), the negative items cannot be seen as the other end of a one-dimensional scale. Thus, negatively formulated items do not load on the same factor as the other EBJW items and have to be seen as something different. Referring to the content, it seems to be reproducible that there is a difference in the two ways of formulation. Positive and negative items differ from each other because the former are more general, while the latter ones are specific. Based on the findings, it could be assumed that concerning the new construct, no negative items in terms of injustice items should be included because of the unipolar and one-dimensional conception, just like in the just-world construct (Schmitt et al., 2008). The focus lies on the six positive items, and here the scale analysis demonstrates that this new scale is valid and possesses very satisfying quality criteria. As a result, the first hypothesis can be affirmed.

Corresponding to the present findings, there is evidence for significant correlations between the EBJW and socio-demographic variables. In line with a study by Schmitt et al. (2008) and in contrast with the results of Dalbert et al. (1987) in the context of the BJW, the EBJW seems to be linked to sex and educational achievement in the present sample. At the same time, Dalbert et al. (1987) found a higher BJW in older than in younger participants, which the results of the present study confirm. Thus, the second hypothesis can also be seen as affirmed: older people have, by tendency, a higher EBJW than younger. In contrast, findings concerning educational achievement and sex are ambivalent, although there are significant correlations between them and the EBJW. The empirical findings are heterogeneous and it is difficult to draw a final conclusion. In the present sample, men have a higher EBJW than women and the EBJW decreases with an increase in educational achievement. However, due to the small sample size, no conclusions can be drawn with regard to the general population. Instead, further results and confirmation are needed.

A between-group comparison via *t*-test supports the validity of the scale, in terms of confirming the expected finding that car- and motoring-club members have a more strongly pronounced EBJW than members of environmental groups. Due to these significant differences between members of various criteria groups with regard to their EBJW, the hypothesis three can be seen as confirmed.

As the results prove, a higher EBJW involves more outrage regarding the insufficient furtherance of personal goals with respect to social and/or economic issues, and at the same time, the EBJW correlates with justification arguments. Justification could already be observed in the context of the just-world belief in general as previous studies have shown that a strong BJW increases the motivation to justify inequality (Beierlein, Werner, Preiser, & Wermuth, 2011). While these correlative findings give us information about the disposition of the new concept, hypothesis four can also be accepted.

The fifth hypothesis includes that the EBJW is a significant predictor for energy-protective behavior and behavior that contradicts with energy protection. The results of multiple regression analyses confirm this assumption. The EBJW helps to explain a willingness to buy new, energy-saving equipment but also a commitment for goals that contradict energy conservation with opposite regression weights.

This finding can be seen as theoretically meaningful for modeling. It has proven to be helpful to integrate the EBJW into the model. This underlying model states that justice- and responsibility-related cognitions and emotions are important predictors for energy-relevant behavior and commitment. This can be confirmed by multiple regression analyses, attached in the appendix, as there are—apart from the opposite directions of the regression weights—different patterns of qualifying predictive variables depending on the criterion. However, the EBJW qualifies for both types of behavioral criteria (energy-saving as well as risky behavior).

We have to keep in mind that the results also indicate that there are connections between the predictors. However, these co-linear finding did not preclude the qualification of the variables as predictors. One important inter-correlation is that between the EBJW and the justification. Maybe this new construct, similar to BJW and system justification, also involves motivation with regard to the status quo as just. It is questionable whether the EBJW includes the desire for the actual justice of an agreeable environment. If so, this would coincide with the fact that when injustice is observed in the natural world, the belief is imperiled and individuals may be motivated to restore it again to avert dissonant feelings.

But maybe, similar to system justification theory, the EBJW is an expression of denying or ignoring environmental damage strongly linked with the main concern to support the status quo. This benefits behavior that includes the status quo, i.e., goals that contradict with energy conservation in the present case. This is in line with our findings from the present study. At the same time, a strong belief in an ecologically just world leads to an unwillingness to pursue pro-environmental action. The justification of the status quo makes it possible to confirm that there is no need for action or to modify one's own behavior. The examination of relationships between the EBJW and other constructs leads to the conclusion that the EBJW indeed possesses the function of justification.

Finally, the last hypothesis can be seen as confirmed: It could be found that the direct effect of the EBJW on energy-relevant behavioral commitment is mediated by other cognitive and affective variables. This could be affirmed related to the readiness to save energy as well as to commit oneself to goals that contradict with energy protection. In the analyses, a strong indirect effect of the EBJW could be found, while almost half of the total effect of the EBJW on the criterion can be traced back to mediating effects by indignation about the insufficient furtherance of economic and social interests and justification arguments. This is very interesting insofar as both aspects are included: an emotional as well as a cognitive component, which both reduce the direct effect of the EBJW. Furthermore, this result confirms the suggestions that the EBJW is more like a disposition and consequently not as behavior-oriented as the two other constructs. Because of the proximity to behavior, it seems to be reasonable to superordinate EBJW to these two constructs. Nevertheless, it is very interesting that the EBJW has a greater direct influence on environmentally risky behavior than on commitment to pro-environmental behavior. This confirms the assumption that EBJW is related to justifying the status quo, i.e., maintaining the current behavior even though it has negative consequences for the environment.

The significance of the EBJW as a new scientific construct can be disputed: It could be debated if such a new construct promotes (fundamentally) new findings and is therefore necessary to introduce. Indeed, this question cannot be answered by certain as further research is necessary to form a conclusive judgment. There is some evidence from the present study which suggests a practical significance of the new construct: first of all, the development of a scale to measure this new construct with satisfying construct and criteria validity was successful. Although there are correlative findings with other constructs, the EBJW differs sufficiently from these constructs, which can be seen in terms of a mutual factor analysis. Consequently, it was possible to use the instruments in the context of other questionnaire studies. Second, this construct seems to measure a concept which is meaningful in the context of energy-relevant behavior. It can also be assumed that this is not restricted to this sphere of activity but is also associated with other environmentally significant behavior. Therefore, this construct represents an interesting expansion of environmental approaches in general. Third, it could be shown that the EBJW can explain certain behavior and correlates meaningfully with various other constructs. While the EBJW is connected with—and leads to—behavior that is harmful to the environment, it might also be a meaningful issue to apply in intervention. The practical implementations can be manifold, but it seems to be important to attain a higher level of awareness for the ecological situation in our world as there are many ecological problems that pose severely unjust ecological situations.

Methodologically, there are some limits of the study. The sample size ($n = 312$) is comparatively small, so all descriptive findings concerning the EBJW and especially the relationship between the occurrence of the EBJW and socio-demographic variables need to be viewed skeptically. It is not possible to draw conclusions with regard to the general population. A further point of critique in this context concerns the relationship between the correlation of sex and age with the EBJW and the fact that, in the sample, old and male members of car- and motoring-clubs are over-represented. However, only 21 out of 33 of the car- and motoring-club members were used for the analysis described before, whereas the partial sample includes 220 participants in total. Also, a partial correlation in which the membership in car- or motoring-clubs was residualized demonstrate that the correlation between the EBJW and age ($r = .21$; $p < 0.01$) as well as sex ($r = -.19$; $p < 0.01$) still exists. Nevertheless, further research with a bigger sample size may be necessary.

Moreover, the present study is restricted with respect to energy-relevant emotions and cognitions. For further validation of the scale, other constructs might be interesting to examine in the context of the EBJW. These variables are constructs that help to characterize the EBJW in more detail; furthermore, the BJW construct itself should be examined in more depth with regard to the distinctness of its two concepts. It is indispensable to examine the possible connection between the BJW construct and the EBJW. Are these two constructs related to each other? And if so, what is the direction of the link? Do they both influence the same behavior or does the EBJW have an advantage over the BJW in the context of explaining environmental questions? This definitely has to be clarified.

In addition, the examination of the relationship between the EBJW and other already existent, domain-specific just-world scales, such as the scale in the school

context, could bring further knowledge and offer a broader insight to the present study. For continuing validation, another, broader sample consistency might lead to a better understanding of the construct. Besides the requested bigger sample size, specific samples with participants from big metropolises with no access to nature versus rural participants would be of lasting interest. Finally, the results should be cross-validated by supplementary methodological approaches such as experimental or longitudinal studies.

In summary, the present study leads to the assumption that the development of the new EBJW construct is a successful extension in the field of environmental psychology. First analyses deliver interesting results with further research being necessary. The construct has to be validated against other constructs, specifically with regard to its relationship to the general BJW, to test the compliance with Dalbert's (1996) postulation and if the EBJW is clearly distinguishable from the general belief in a just world. On the basis of the present findings, it is advisable to use a scale including six items. All in all, the findings can be seen as evidence that the scale is certainly interesting and warrants further research.

Acknowledgments The authors are grateful to Jonas Bodensohn, Kathleen Stewart and Carolin Hammwöhner for their support and assistance in preparing the manuscript. The present research was supported by a Grant from the Foundation of the Catholic University of Eichstätt-Ingolstadt, awarded in connection with the fellowship in the post graduate program "sustainability in economy, environment, and society" at the Catholic University of Eichstätt-Ingolstadt.

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