Article

Development and Validation of the Readiness to Change Scale (RtC) for Sustainability

Mirko Duradoni [1,*], Giulia Valdrighi [1], Alessia Donati [1], Maria Fiorenza [1], Luisa Puddu [1]
and Andrea Guazzini [1,2]

1   Department of Education, Literatures, Intercultural Studies, Languages and Psychology, University of Florence, 50135 Florence, Italy; giulia.valdrighi@edu.unifi.it (G.V.); alessia.donati@edu.unifi.it (A.D.); maria.fiorenza1@unifi.it (M.F.); luisa.puddu@unifi.it (L.P.); andrea.guazzini@unifi.it (A.G.)
2   Centre for the Study of Complex Dynamics, University of Florence, 50135 Florence, Italy
*   Correspondence: mirko.duradoni@unifi.it

Abstract: The climate emergency is increasingly looming, and its consequences on nature and human systems are increasingly severe and pervasive, as reported by the world's leading conferences and organizations on the subject. There appears to be an immediate need to adopt more sustainable behaviors in order to stem consequences that are becoming increasingly dramatic. In this regard, environmental psychology and other related disciplines have sought and still seek to understand how to translate the environmental concerns of individuals and communities into effective and efficient conservation and protection actions to contain the emergency and avoid further consequences. The contribution of psychological theories, particularly the transtheoretical model of change and the planned behavior model, appears very promising for assessing and promoting the potential for activation toward sustainability. The aim of this study was to develop a new conceptualization of the psychological construct of readiness to change (RtC) applied to sustainability issues and validated internally and externally through two separate studies (N1 = 228, N2 = 713). The sample for the two studies was recruited by distributing an anonymous online survey. For Study 1, we administered an online survey investigating basic sociodemographic characteristics and the preliminary set of 42 items of the readiness to change scale. For Study 2, the survey was composed of the following tools: a sociodemographic form, the readiness to change scale, a connectedness to nature scale, a climate change attitude survey, consumers' perceived readiness toward green products, and a pro-environmental behaviors scale. Through exploratory factor analysis and confirmatory factor analysis, 29 items were selected from an initial set of 42. The 29 items were divided and organized into seven factors (namely: perceived importance of the problem/change, motivation, self-efficacy, effectiveness of the proposed solution, social support, action and involvement, and perceived readiness). Each factor showed adequate reliability (McDonald's ω range: 0.74–0.87). Regarding external validity, the scale showed correlations—with typical to large effect sizes—with pro-environmental identity, green attitudes, sustainable intentions, and pro-environmental behaviors (PEBs) (i.e., conservation, environmental citizenship, food, transportation). Given the results obtained, we can say that the scale we constructed can infer the individual's propensity to enact PEBs, and consequently it can give input to the implementation of interventions aimed at stimulating RtC and, therefore, sustainable behaviors. In conclusion, the scale appears valid and usable for assessing the activation potential of both individuals but also at the group and community levels—the latter factor being an important contribution to scientific research, since most of the instruments used to date fail to estimate this aspect.

Keywords: climate change; environmental psychology; readiness to change; PEBs

1. Introduction

As emphasized by both the Intergovernmental Panel on Climate Change (IPCC) and the 27th United Nations Climate Change conference (COP27), the climate emergency, in line with forecasts, is steadily progressing, resulting in progressively severe and conspicuous impacts on global natural and human systems [1]. The report also emphasizes the immediate need to adopt new, more sustainable behaviors to avoid more serious consequences. Experts from various disciplines have painted a comprehensive picture of the factors potentially linked to the limited proactive engagement of human communities and individuals in altering their habits to mitigate the environmental impact of their lifestyles, despite the apparent real and imminent risks. Cognitive factors (e.g., limited knowledge), experiential factors (e.g., experiencing extreme weather events), and socio-cultural factors (e.g., observed behaviors of others in the surrounding environment) seem to collectively shape the perception of environmental risk [2]. Despite the vast body of literature on environmental risk perception, it appears evident that there is a gap in the existing research concerning an estimation of the potential activation of individuals and communities to address climate change. This gap is noteworthy as human beings do not solely move and alter their behaviors based on risk management considerations.

1.1. Readiness to Change Framework

The research on behavioral and psychological change has undergone significant advancement over the years, emerging as a prominent field of analysis in scientific literature, particularly within medical, clinical, and organizational domains. In a concise overview of the concept and its theoretical frameworks, Schwarzer [3] distinguishes between stage models and continuum models. In continuum models, individuals are positioned along a spectrum of action that reflects the feasibility of undertaking said action. Prominent approaches in this category include the theory of reasoned action, the theory of planned behavior, and protection motivation theory [4–10]. Conversely, stage models consider process characteristics by delineating a specific number of qualitative stages. The predominant model within this framework is the transtheoretical model of behavior change (TTM), as exemplified by a series of works [11–14].

The two different kinds of perspectives on the matter present their own limitations. Researchers have suggested two major theoretical deficiencies of continuum models, the first one being a single prediction rule for describing behavior change, implying that cognitive and behavioral changes occur in a linear fashion, and that a general approach is suitable for all individuals engaging in unhealthy and harmful behaviors—this excludes qualitative changes during the course of time; secondly, continuum models mostly do not account for the post-intentional phase in which goals are translated into action [3].

In regard to stage models, as stated before, the TTM has also received some criticism: Bandura [15] argued that different qualitative stages necessarily imply that individuals cannot move back in the transition, and that they cannot progress from one stage to another while passing over a third one. Weinstein, Rothman, and Sutton [16] and Sutton [17] state that the notion of stages might be flawed or circular, since the stages are not genuinely qualitative but are arbitrary subdivisions of a process that is intrinsically continuous. Moreover, the critical factors that move people from one stage to another still need identification [18].

Despite the growing interest in the matter, the different approaches, and the long history of "human change" as a psychological and behavioral subject, one of the newest additions to the greater construct, "readiness to change", is presented by the literature in a somewhat disjointed manner. This aspect in particular was described and adapted to many models presented to the scientific community, but only recently has it been considered as a construct of its own—and this feature may shed some light on some specifics of human behavior. Rafferty and colleagues define the "readiness to change" as the extent to which an individual or individuals are cognitively inclined to accept, embrace, and adopt a particular plan to purposefully alter the status quo [19]. Readiness is the cognitive precursor to the behaviors of either resistance to, or support for, a change effort. It is the people who are

the real source of, and the vehicle for change, because they are the ones who will either embrace or resist change. Therefore, it is vital to assess an individual's readiness perception prior to any change attempt [20].

As mentioned above, the construct, despite its recent per se creation, has been addressed in some way by models for change already present in the literature, in the part that precedes the actual change and succeeds that of the resolution of the change, and in the type of models that can be approximated to the intention. Several social psychological models, including the theory of reasoned action [21,22], the theory of planned behavior [23,24], Triandis's attitude–behavior theory, and protection motivation theory [25] converge on the proposal that the most immediate and important predictor of a person's behavior is their intention to perform it [26], as intentions are people's decisions and feelings to perform particular actions—that is, behavioral intentions encompass both the direction and the intensity of a decision [26]. Intentions have been used to predict an impressive range of behaviors, which extend from health habits to prosocial tendencies [26]. There is also another sense in which control is important in determining the strength of intention–behavior relations—the person must have control over performing a behavior if the intention to perform that behavior is to be realized [26]. In Sheeran's 2002 study, it is stated that intention is the key index of a person's mental readiness for action in several social psychological models of behavior and the intention construct is employed extensively to understand social and applied issues; the segment between intentions and behaviors, the black box that is often called the "intention–behavior gap" described in the continuum models, is not negligible. Most notable in this regard is the accumulated evidence supporting the utility of implementation intentions in enabling people to enact their intentions [26]. Regarding the transtheoretical model of behavior change, readiness to change and its significance can be found in the first three stages of the theory: in the precontemplation stage people do not intend to start the new behavior in the near future and may be unaware of the need to change and not ready for it, while in the contemplation stage participants are intending to start the healthy behavior within the near future, getting ready to embrace it. Lastly, the preparation stage is the stage where people feel ready to start taking action. [27–32].

Having proposed the different definitions of the psychological construct of "readiness to change", in this paper we propose the potential of mutating the concept of RTC from the clinical domain—and its subsequent diverse division, regarding both stage and continuum models—toward its multidimensional conceptualization: inside the concept of "readiness to change" one can find a part that relates to awareness, one that relates to self-efficacy, one that relates to motivation, and so on. The aspects that constitute the construct of readiness to change will be briefly presented below, as the exact concept and definition of readiness to change that was adopted and implemented in this article is composed by seven different dimensions. Researchers from different areas of interest have conducted studies examining the connection between one or more of these dimensions and the adoption of environmentally friendly behaviors. This literature shows evidence to support our hypothesis that there is a relationship between each of these seven dimensions and the adoption of PEBs.

1.1.1. Perceived Importance of the Problem/Change

Within the Health Action Process Approach (HAPA [3]), a model of behavioral change in the area of health behaviors, there is the perception of risk ("risk perception") as a predictor of behavior change. This model argues that there must be a minimum level of threat or concern before people begin to contemplate the benefits of possible actions and contemplate change. Within this model, self-efficacy and outcome expectations have the greatest importance, while threat (or risk perception) may not contribute a direct influence. However, risk perception may be of considerable importance as an indirect factor within the motivation stage. On the other hand, Miller and Tonigan's [33] SOCRATES, based on the transtheoretical model of Prochaska and DiClemente [13], argues that readiness to change is based on a continuum of stages from precontemplation to maintenance. In addition to this,

the authors also determine other factors related to change, describing "recognition", which is the recognition of one's problem behavior. High recognition scores indicate that subjects have high awareness of the problem, express a greater desire to change, and perceive that their behavior will cause problems if they are unwilling to change. This is thus directly related to the likelihood of actually enacting change.

1.1.2. Motivation

The study of Cox, Blount, Bair, and Hosien [34] identifies how high levels of motivation (measured with the Motivational Structure Questionnaire (MSQ) [35]) are positively correlated to high determination to change and high readiness to change. People with high motivation felt committed to pursuing goals that they were likely to achieve, and if successful, would bring them emotional satisfaction. David Ryder [36], in his article "Deciding to Change: Enhancing Client Motivation to Change Behavior", noted that cognitive behavioral therapy, while correctly focusing on change, can be improved by using procedures that enhance the client's motivation to engage in change and maintain it over the long term. He suggests, in this regard, that therapists use the technique of motivational interviewing [37–39] in order to increase motivation in clients and the likelihood that they will maintain their changed behavior.

1.1.3. Self-Efficacy

As mentioned above, the Health Action Process Approach (HAPA [3]) predicts self-efficacy (in its components of task self-efficacy, maintenance self-efficacy, and recovery self-efficacy) as a major direct predictor of change, while Rollnick and Miller's motivational interviewing [39], a counseling method used to facilitate problem pattern changes, sees as its final step the therapist's elicitation of an increase in the client's self-efficacy, thereby encouraging the possibility that the client will change his or her behaviors, and the Health Belief Model, in trying to explain the factors that lead to behavior change, also includes self-efficacy as a factor, as a belief that one can enact change. Cunningham and colleagues [40] show that individual factors that significantly impact readiness for change include a more active approach to problem-solving and greater feelings of self-efficacy. In addition to the stages already pertaining to the transtheoretical model of change, self-efficacy was recently added as a new part of the framework [41], and it is defined as the perception of the individual that he or she has the capability to successfully change [14].

1.1.4. Effectiveness of Proposed Solution

Outcome expectancies and their future effectiveness are defined as the believed consequences of a person's behavior. More specifically, outcome expectancies refer to the anticipation of physical, self-evaluative (or affective), and social outcomes of one's behavior [42]. Human behavior is driven by forethought as a temporal extension of agency reflecting forward-directed planning [43]. Forethought is not only expressed by setting goals [44] but also by constructing outcome expectancies from people's "observed conditional relations between environmental events in the world around them" [43]. Outcome expectancies are the believed consequences of a person's prospective behavior [43,45] and relevant for behavior and actions of all kinds [42]. In the extended parallel process model (EPPM), which is a fear appeal theory that illustrates how individuals react to fear-inducing messages [46], it is described how persuasive fear-inducing messages induce intended behavioral responses. In the approach, the term effectiveness indicates whether exposure to a fear appeal message results in more persuasion than a comparison condition. In the work done by Tannenbaum and colleagues [47], it is found that fear appeals consistently work and are effective.

In the HAPA model by Schwarzer [3], outcome expectations (pros and cons behavior) influence as determinants of behavioral intention and are predictive of behavior change: positive outcome expectancies are chiefly seen as being important in the motivation phase, when a person balances the pros and cons of certain behavioral outcomes. Perceived self-

efficacy operates in concert with positive outcome expectancies, both of which contribute substantially to forming an intention.

1.1.5. Social Support

Social support is one factor reflecting the barriers and resources part of the HAPA model: support represents a resource, and the lack of it can be an obstacle to adopt or maintain healthy behaviors [48]. As already discussed before in previous studies [49], self-efficacy is found to be the most important factor in predicting behavior, and self-efficacy and social support are highly correlated [50,51].

Individuals are more likely to initiate change in the presence of others who are helpful, encouraging, and understanding [52]. Thus, individuals who are contemplating a change or are making initial efforts to change will benefit more from the presence of supportive others. In contrast, social support should play a less important role in readiness to change for those who are not willing to change or who have already integrated the change into their behavior [53].

1.1.6. Action and Involvement

In the transtheoretical model by Prochaska and DiClemente [13], there is the stage of action among the five provided in the behavioral change process (pre-contemplation; contemplation; preparation, action, maintenance): in the action stage, people have recently changed their behavior and intend to continue moving forward with this behavioral change. People may modify their problem behavior or acquire new behaviors, as they need to work hard to keep moving ahead [27–32]. In the Schwarzer and colleagues article from 2011 [48], it is described that when a person is inclined to adopt a particular health behavior, the "good intention" has to be transformed into detailed instructions on how to perform the desired action. Once an action has been initiated, it has to be maintained, and this is not achieved through a single act of will but involves self-regulatory skills and strategies. This action stage was thus found to be significantly different from the other ones [48,54–58].

1.1.7. Perceived Readiness

Perceived readiness, understood as the perception of one's willingness and preparedness for change, has been used as an index of readiness for change by various general instruments mostly employed in clinical, organizational, and social fields, like the contemplation ladder [59] and the readiness ruler [60], and even more specific rulers such as those described in "Readiness to Change Rulers for Decreased Drinking and Increased Condom Use" by LaBrie and colleagues [61]. Kwahk and Kim [62] have outlined four possible antecedents of readiness for change: organizational commitment, perceived personal competence, performance expectancy, and effort expectancy. According to them, the first two factors are more relevant to individuals' tendencies and characteristics regardless of the system introducing the organizational change. Perceived personal competence, in particular, is the degree of competence in the work role [63]. A high level of perceived personal competence leads to employee self-confidence, when they believe they can execute the particular task under any setting and even different tasks, ones an employee is not used to perform. This is particularly important in times of change, when the level of uncertainty rises and the people are forced to improvise, trying new approaches to fulfill the tasks [62]. Venkatesh and colleagues [64] have indicated that individuals' behavioral intentions to use a new approach is influenced by performance expectancy and effort expectancy for the system [62].

1.2. Readiness to Change and Pro-Environmental Behavior

The literature that investigates the construct of readiness to change in relation to pro-environmental behavior is rather poor; few studies have been dedicated to the application of this multidimensional construct to environmental issues. As regards the minority of studies on the subject, there is little correspondence with pro-environmental behaviors

taken into account from various authors, as well as with the concept of readiness to change, in particular regarding the dimensions it contains inside.

The concept of RtC we adopted includes seven dimensions: motivation, action/involvement, self-efficacy, social support, risk perception, response efficacy, and perceived readiness.

Some authors have conducted studies examining the connection between one or more of the above dimensions and the adoption of environmentally friendly behaviors. This literature shows evidence to support our hypothesis that there is a relationship between each of these seven dimensions and the adoption of PEBs.

1.2.1. Perceived Importance of the Problem/Change and PEB

Risk perception appears to be an important predictor of the commitment to implement environmental protection behaviors [65–67]. People who perceive climate change as an urgent problem that exposes us to major risks are more likely to engage in behaviors that reduce the negative impact of humans on the planet. Risk perception represents the urgency that people perceive about climate change and the degree to which they feel responsible for the implementation of conservation behaviors. Bradley et al. [66] report that risk perception influences sustainable behavior indirectly only. Van Valkengoed and Steg [67], in the meta-analysis that they conducted, indicate that risk perception is strongly associated specifically with people's intentions to adapt. These results support the utility to understand the precursors of environmental risk perception.

1.2.2. Motivation and PEB

A large number of studies show the importance of self-determined/intrinsic motivation for pro-environmental behaviors [68–70]. PEB is consistently positively associated with how much people endorse self-determined reasons (i.e., because such a goal was fun and/or valuable to them) and deny controlled reasons (i.e., because of guilt or external inducements) [68]. Therefore, the motivation to change turns out to be an important factor that can have a significant impact on the choice to implement pro-environmental behaviors. This evidence leads us to reflect on the possibility of designing interventions that aim to develop motivation to change and highlights the question of how to motivate people to engage in more environmentally responsible behavior.

1.2.3. Self-Efficacy and PEB

Studies that have investigated the role of self-efficacy support the logic that this dimension may influence the adoption of PEBs [67,71–73]. So, if individuals believe they have the skills and resources to implement PEBs successfully, they are more likely to engage in the effective implementation of these behaviors. Van Valkengoed and Steg [67] found that perceiving higher levels of self-efficacy was associated with more adaptive behavior. Emery [72] discusses that participants with higher levels of self-efficacy reported greater intentions to engage in PEB and higher ratings of climate change belief. A study by Abraham et al. [73] utilized environmental self-efficacy as a predictor variable of pro-environmental behavior and confirmed the robustness of self-efficacy in this specific field. These results suggest that interventions aimed at increasing self-efficacy may encourage behaviors to change.

1.2.4. Effectiveness of Proposed Solution and PEB

Response efficacy represents the degree to which people believe that PEBs will be effective in protecting themselves from the negative risks arising from climate change. It emerges from the literature that people who have strong beliefs about the usefulness of PEBs to stem environmental problems will more easily engage in the implementation of these actions, considered efficient [66,67,72]. Van Valkengoed and Steg [67] found that a stronger perceived outcome efficacy is related to more adaptive behavior, and that therefore the perception of outcome efficacy is of critical importance in predicting different types

of adaptive behavior. Emery's article [72] reported that the correlation analysis showed that response efficacy was positively correlated with PEB intentions and climate change belief, indicating that participants with higher levels of either outcome efficacy had greater intentions to engage in PEB and higher ratings of climate change belief. Behavior was predicted by response efficacy both indirectly and directly [66].

1.2.5. Social Support and PEB

The impact of social support on sustained environmental behavior cannot be ignored. Wan and Du's [74] study measured social capital from four aspects: social trust, social norms, social network, and social participation; and it empirically tested the influence of social capital on private and public PEB. The enhancement of social capital enriches environmental knowledge and promotes private and public PEBs. The authors put forward policy suggestions on institutional aspects, such as increasing support for informal environmental organizations, carrying out differentiated sustainable development education, and improving the mechanism of environmental information communication. Shi and colleagues [75] distinguish social capital in two dimensions—individual social capital (ISC) and collective social capital (CSC)—and classify pro-environmental behaviors into two categories: private and public. Their study reports that ISC (based on network learning, social support, and social identity) and CSC (based on social norms and social trust) have significant positive effects on both private and public PEBs. The effect of CSC on sustainable behavior is much lower than that of ISC. Their results indicate that a high level of social capital is instrumental in encouraging residents' pro-environmental behavior. Other studies demonstrate the importance of social norms [76,77] in influencing PEB. People who have strong social norms are likely to adopt pro-environmental behavior.

1.2.6. Action/Involvement and PEB

There is a growing body of research demonstrating positive correlations between different pro-environmental behaviors [71,78,79]. Past pro-environmental behavior increases the likelihood or extent of engaging in new or different pro-environmental behaviors [71]. It seems that past engagement in easy behaviors increases intentions to engage in more difficult behaviors in the future; this phenomenon is called the spillover effect. Environmentally friendly behavior can be promoted by reminding people of their past pro-environmental actions as this will strengthen one's environmental self-identity [79]. More specifically, the more often individuals acted environmentally friendly in the past, the more likely it is that they will perceive themselves as environmentally friendly persons. Moreover, Van der Werff et al. [79] showed that the manipulation of the salience of past behavior had an effect on proxies of environmental behavior. The strong implication of these findings is that the promotion of everyday "green" behaviors may prepare the grounds for increasing acceptance of more far-reaching changes in the population [78].

1.2.7. Perceived Readiness and PEB

In reference to the last dimension of the model, some studies have investigated the relationship between perceived readiness to be green and a specific PEB, sustainable consumption. These studies demonstrate the positive influence of perceived readiness on the intention to buy green products [80–82]. When consumers think that they are ready to be green (e.g., have the ability in terms of knowledge and time), they are more likely to purchase green products [80]. Moreover, Arli et al. [80] reported that readiness to be green also mediates the impacts of attitude, perceived behavioral control, pro-environmental self-identity, and perceived sense of responsibility on purchase intention. Their findings suggest that positive attitudes towards buying a green product may not translate into green purchase intention if consumers do not think that they are ready to be green. This may in part help to explain the subsequent discrepancy between attitude and behavior. The authors also studied antecedents of readiness to be green. Their analyses show that people who have a stronger attitude, perceived behavioral control, self-identity towards the environment,

and perceived sense of responsibility are more likely to be ready to be green. The authors suggest that perceived readiness to be green comes from 'internal' factors (e.g., identity, sense of responsibility) and not from external influences (i.e., families and obligation). Tan et al. [81] stated that some consumers do not perceive being environmentally friendly as an urgent issue that requires immediate attention, but instead, something they can only commit to once they are truly ready, that is, when they have time to be green and when they have fulfilled their other responsibilities. Perhaps, concerted efforts are required to make "being green" appear easy, attainable, and, mainly, normal.

1.3. Aim of the Study and Hypotheses Development

The purpose of this study is to propose a new instrument for measuring individuals' readiness to change toward the adoption of more sustainable behaviors. Drawing upon the literature presented in the introductory section, we conceptualized and subsequently operationalized readiness to change as a multidimensional construct consisting of seven dimensions. To assess the scale's validity and reliability, we conducted two studies. The first study aims to provide an initial assessment of the scale's dimensionality through exploratory factor analysis, serving the subsequent refinement of the scale. In the second study, we will test the factor structure identified in Study 1 on an independent sample, as well as provide evidence of external validity by measuring the degree of association between the readiness to change dimensions and four main clusters of variables: pro-environmental attitudes, pro-environmental identity, pro-environmental intentions, and pro-environmental behaviors. Below, we will detail the rationale for selecting each of the four clusters and articulate the hypotheses we will test.

1.3.1. Justification for External Validity Hypotheses Development
Pro-Environmental Attitude and Readiness to Change

The psychological construct of "attitude" is defined as a summary evaluation of an object of thought, as an attitude object can be anything a person discriminates or holds in mind. While different researchers have defined attitudes in various ways, two essential attitude functions emerge from empirical research: for individuals, attitudes are cognitive schema that provide a structure to organize complex or ambiguous information, guiding particular evaluations or behaviors. More abstractly, attitudes serve higher psychological needs—expressive or symbolic functions (like affirming values), maintaining social identity, and regulating emotions. Furthermore, the theory of planned behavior (TPB), elaborated by Ajzen for the purpose of improving the predictive power of the theory of reasoned action (TRA), is a psychological theory that links beliefs to behavior, maintaining the three core components, namely, attitude, subjective norms, and perceived behavioral control, that together shape an individual's behavioral intentions. The term "belief" in this theory refers to the subjective probability that the behavior will produce a certain outcome. Specifically, the evaluation of each outcome contributes to the attitude commensurately with the person's subjective probability that the behavior produces the outcome in question [22]. In the study undertaken by Haqq and Natsir [83] it is described that, in general, individual readiness to change is an attitude of willingness to accept and support a change plan, whereupon the definition of readiness to change as "the beliefs, feelings, and intentions of individuals regarding the extent to which change is needed and the capacity to successfully implement change" is considered to be more suitable than the multidimensional concept comprehended in this study [83–86]. Regarding the sustainability perspectives of attitude and their relationship with the readiness to change construct, Valkila and Saari [87] express how today these environmental considerations are a ubiquitous part of all people's attitudes, as even ignorance regarding environmental issues is the expression of an attitude.

The evidence presented in the literature and discussed briefly in this section underlies the potential that the RtC construct has in predicting attitude formation, particularly in its environmental implications. Therefore, we expect the following:

H1: *Higher levels of RtC are positively associated with a pro-environmental attitude.*

Pro-Environmental Identity and Readiness to Change

Identity is defined as the qualities, beliefs, personality traits, appearance, and/or expressions that distinguish a person or a group [88–90]. Identity encompasses various aspects, such as occupational, religious, national, ethnic, gender, educational, generational, and political identities, among others, and serves multiple functions, acting as a "self-regulatory structure" that provides meaning, direction, and a sense of self-control, fostering internal harmony and serving as a behavioral compass, enabling individuals to orient themselves towards the future and establish long-term goals [88]. Identity also originates from traits or attributes that individuals may have little or no control over, such as their family background or ethnicity. Understanding if and how a readiness to change can predict increases in one's exploration of identity alternatives and decreases in one's commitment to a former identity is therefore valuable knowledge. Literature results suggest that readiness to change may play a role in adult identity development [91]. Turning to the green aspects of identity and the connection to readiness to change, in the study from Arli and colleagues [80] it is shown how people who have a stronger self-identity toward the environment and perceived sense of responsibility are more likely to be ready to be green. Pro-environmental self-identity has been found to predict environmental behavior, such as recycling [92], carbon offsetting, waste reduction, and energy conservation [80,93].

The indications provided by the scientific literature and briefly presented in this paragraph imply the potential that RtC holds in predicting the formation and organization of personal identity, which poses clear implications in decisions made on green and environmental issues.

Therefore, we expect the following:

H2: *Higher levels of RtC are positively associated with pro-environmental identity measures.*

Pro-Environmental Intention and Readiness to Change

The literature that investigates readiness to change in relation to intention is quite substantial, probably because intention seems to be a fundamental component of RtC. The theory of planned behavior can provide a theoretical framework. The TPB can be schematized as follows: attitudes toward behavior, subjective norms, perceived behavioral control → behavioral intention → behavior change [24]. Bernerth [94] suggested that readiness to change is more than understanding and believing in the change, but readiness is a collection of thoughts and intentions toward the specific change effort. Readiness to change is conceived as a multifaceted concept that comprises an emotional dimension of change, a cognitive dimension of change, and an intentional dimension of change [84]. The individual's readiness to change determines their intentions, attitudes, and motivations for change and influences their preparation and planning to adopt the new behavior [95]. Therefore, intention is necessary for the successful implementation of the change process [96]. The evidence in the literature, confirming the expectations under the general model, shows that green intention is very important for behavioral change towards more sustainable actions. Arli et al. [80] found that consumers' readiness to be green positively influences consumers' intention to purchase green products. Readiness to change one's current lifestyle also positively influences the intention to purchase sustainable products [97].

Overall, the literature depicts intention as an essential component of readiness to change. As the intention increases, the RtC seems to increase. So, based on the evidence in the literature, we put forward the following hypothesis:

H3: *Readiness to change is positively related to pro-environmental intention.*

Pro-Environmental Behavior and Readiness to Change

From a psychological perspective, readiness relates to the mental and physical preparation to experience an action [98]. Readiness to change can be defined as the extent to which an individual or individuals are cognitively and emotionally inclined to accept, embrace, and adopt a particular plan to purposefully alter the status quo [99].

The literature shows that there is a lack of models to assess readiness to change, especially towards pro-environmental behavior. Nonetheless, there are readiness to change models that have previously been used in other sectors (i.e., health, food, finance, education) but limited work has been undertaken to apply these models to readiness to change towards pro-environmental behavior [100]. A popular one is the transtheoretical model of behavior change (TTM), developed by Prochaska and DiClemente [13]. The TTM provides an integrated framework for comprehending and influencing human intentional behavior change through five key stages: pre-contemplation, contemplation, preparation, action, and maintenance [101]. Readiness to change increases through the different stages. This model has been recognized to promote willingness towards adoption of good behaviors [100]. Considering that the adoption of sustainable practices is considered as good behavior, the TTM model is useful in encouraging pro-environmental practices.

Results in the literature suggest a link between pro-environmental behavior and readiness to change, so high levels of readiness could predict high levels of PEB. Therefore, on the basis of the literature, we formulate the following hypothesis:

H4: *Readiness to change is positively related to pro-environmental behavior.*

2. Methods

2.1. Participants and Design

Before proceeding with recruitment for the two studies, we ensured that the sample sizes were adequate for the study's purposes and the type of analysis we intended to conduct. For Study 1, which involved exploratory factor analysis, we referred to the work of de Winter and colleagues [102]. In our specific case, with a pool of 42 items organized into 7 factors, a sample size of around 200 would be sufficient for conducting exploratory factor analysis assuming factor loadings in line with those recommended by Ferguson and Cox [103] ($\lambda \geq 0.50$). Regarding Study 2, we considered both confirmatory factor analysis and correlation analysis to determine the sample size based on the analysis requiring the highest number of observations. For confirmatory factor analysis, it is typically recommended to have 10 participants for each scale item [104], resulting in a required sample size of 290 in our case. For correlation analysis, we conducted a power analysis using G*Power [105,106]. The power analysis indicated that a sample size of 616 would be necessary to achieve a statistical power of 0.80 while being able to detect even a small effect size ($r = 0.10$) at a significance level of 0.05. Overall, the recruited sample sizes for both studies exceeded the calculated thresholds, indicating adequacy for conducting our research.

The sample for the two studies was recruited by distributing an anonymous online survey designed through the Google Forms platform in line with Italian law's privacy requirements (Law Decree DL-101/2018) and EU regulations (2016/679). Data collection was approved by Comissão de Ética do Centro de Estudos Sociais (CE-CES) (University of Coimbra; date: 24 October 2022; protocol number: 02319461). Data were collected through online posts on mainstream social networks sites (Facebook and Instagram, mainly). Therefore, participants can be conceived as voluntaries. The sample of the first study was composed of 228 participants (28.5% cisgender men and 71.5% cisgender women), with an average age of 42.96 years, a minimum age of 17 years, and a maximum age of 78 years (standard deviation = 14.86 years). The sample of the second study was composed of 713 participants (71.8% cisgender women; 24.4 cisgender men; 0.3% transgender men; 0.4% transgender women; 1% non-binary; 2.1% no answer), with an average age of 26.45 years, a minimum age of 16 years, and a maximum age of 80 years (standard deviation = 11.14 years).

2.2. Materials

For Study 1, we administered an online survey investigating basic sociodemographic characteristics (i.e., age and sex) and the preliminary set of 42 items of the readiness to change scale, on a 5-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"), designed to investigate the subject's readiness to change.

For Study 2, the survey was composed of the following tools:

- Sociodemographic form: consisting of questions about demographic characteristics (i.e., sex, age, education);
- The readiness to change scale: consisting of 29 items on a 5-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"), designed to investigate the subject's readiness to change. This scale consists of seven dimensions: perceived importance of the problem (item example: "This change is very important for me"); motivation to change ("I feel motivated to undertake this path of change"); self-efficacy ("I think I have the resources to make this change"); effectiveness of the proposed solution ("I am aware of strategies/techniques/methods that could help me change"); social support ("I know who to turn to among the people close to me for help in changing"); action ("Sometimes I try to find solutions that can work"); and perceived readiness ("In all honesty, I do not feel like I am ready to really change my life") (see the Appendix A for the complete set of RtC items, listed in Table A1). A higher score in each RtC dimension signifies a higher readiness to change;
- Connectedness to nature scale (CTN) [107]: This scale assesses the subject's affective and experiential connection with nature. There are 14 items on the scale with responses on a 5-point Likert scale. Responses range from 1 ("strongly disagree") to 5 ("strongly agree"). An example of an item included in the scale is the following: "I often feel a sense of oneness with the natural world around me". The scale proved to have a very good reliability index (Cronbach's α = 0.84).
- Climate change attitude survey (CCAS) [108]: the scale consists of 15 items answered on a 5-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). The scale, characterized by two dimensions, namely beliefs (i.e., "I believe our climate is changing") and intentions (i.e., "Knowing about environmental problems and issues is important to me"), aims to assess people's beliefs and intentions towards the environment. The instrument reported a good reliability index (Cronbach's α for beliefs = 0.90; Cronbach's α for intentions = 0.78);
- Consumers' perceived readiness toward green products (CPRTGP) [80]: The purpose of this instrument is to explore consumers' willingness to be environmentally friendly and, consequently, how this willingness influences consumers' purchase intention towards environmentally friendly products. The scale consists of eight dimensions: product purchase intentions; readiness to be green; attitudes; subjective norms; perceived behavioral control; pro-environmental self-identity; ethical obligations; and perceived sense of responsibility. The instrument's response mode is on a 5-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). For the purpose of this study, only attitude, identity, and purchase intentions were considered. (Cronbach's α for attitude = not available; Cronbach's α for identity = 0.77; Cronbach's α for purchase intentions = 0.79).
- Pro-environmental behavior scale (PEB) [109]: the scale consists of 19 items with different response modes. Items 1 to 6 have a response mode ranging from 1 ("never") to 5 ("always"). Item 7 has a response mode ranging from 1 ("very high") to 3 ("low"). Items 8, 9, and 12 are dichotomous: 1 ("yes") and 5 ("no"). Items 10 and 11 range from 1 ("never") to 5 ("constantly"). Item 13 has a 5-point Likert scale response mode ranging from 1 ("24 or less") to 5 ("40 or more"). Items 14, 15, and 16 are dichotomous: 1 ("no") and 5 ("yes"). Items 17,18, and 19 have a 3-point Likert scale with responses ranging from 1 ("never") to 5 ("frequently"). The instrument consists of four dimensions, namely: conservation; environmental Citizenship; food; and transportation. The scale reported a good reliability index (Cronbach's α = 0.76).

2.3. Data Analysis

In Study 1, we examined the dimensionality of the test using exploratory factor analysis and assessed the reliability of the identified dimensions through McDonald's omega. In Study 2, we first validated the structure identified in Study 1 using confirmatory factor analysis. The model fit was evaluated with several goodness-of-fit indices: the chi-square to degrees of freedom ratio, the Tucker–Lewis index (TLI), the comparative fit index (CFI), the standardized root mean square residual (SRMR), and the root mean square error of approximation (RMSEA). An acceptable fit is indicated by CFI and TLI values greater than 0.90, with values above 0.95 representing an optimal fit. RMSEA values below 0.08 indicate an acceptable fit, with values close to 0.06 suggesting an optimal fit. An SRMR value below 0.08 is also recommended [110,111]. Following confirmation by the factor analysis, we calculated the total scores for each of the seven dimensions of readiness to change and generated the corresponding descriptive statistics. We then tested our hypotheses using Pearson or Spearman correlations, depending on the normality of the distributions.

3. Results

3.1. Results: Study 1

The initial set of 42 items underwent analysis through exploratory factor analysis. We employed the principal axis factoring extraction method with promax (oblique) rotation. The determination of the number of components to be extracted was informed by a comprehensive examination of the scree plot [112] in conjunction with the application of the Kaiser criterion, which entails retaining factors with eigenvalues surpassing one [113]. Items were considered for retention if their factor loadings exceeded 0.50, and parallel loadings remained below 0.20, following the criteria established by Ferguson and Cox [103]. Through iterative exclusion, items failing to meet the retention criteria were systematically removed.

The analysis of the final set of 29 items suggested a seven-factor structure explaining 67.1% of the total variance of the construct (Table 1). The reliability of the seven dimensions of the RtC scale was assessed using McDonald's omega, demonstrating an overall acceptable level of reliability.

Table 1. EFA results: RtC factor structure, factor loadings, and reliability.

Item n°	F1	F2	F3	F4	F5	F6	F7
1	0.57						
2	0.68						
3	0.85						
4	0.61						
5		0.79					
6		0.63					
7		0.51					
8		0.88					
9			0.77				
10			0.72				

Table 1. *Cont.*

Item n°	F1	F2	F3	F4	F5	F6	F7
11			0.61				
12			0.59				
13			0.66				
14				0.79			
15				0.81			
16				0.50			
17				0.61			
18					0.78		
19					0.65		
20					0.65		
21					0.51		
22						0.57	
23						0.74	
24						0.84	
25						0.77	
26							0.69
27							0.60
28							0.67
29							0.50
McDonald's ω	0.78	0.83	0.87	0.81	0.74	0.83	0.82
Eigenvalues	9.18	2.65	2.16	1.58	1.49	1.41	1.12
Explained total variance	31.67%	9.13%	7.44%	5.46%	5.13%	4.85%	3.40%
Cumulative total variance	67.1%						

3.2. Results: Study 2

3.2.1. Confirmatory Factor Analysis

CFA was performed on the 29 RtC items to investigate the factorial structure that emerged in Study 1. For this reason, we tested a seven-factor structure. Maximum likelihood estimation (MLE) was used to estimate the model's parameters. The CFA showed an optimal fit for the DLB one-factor model ($\chi^2/\mathrm{df} = 3.075$; $p < 0.001$; TLI = 0.92; CFI = 0.93; RMSEA = 0.054; SRMR = 0.046). Moreover, all factor loadings were statistically significant and higher than the conventionally acceptable threshold of >0.50 (Figure 1).
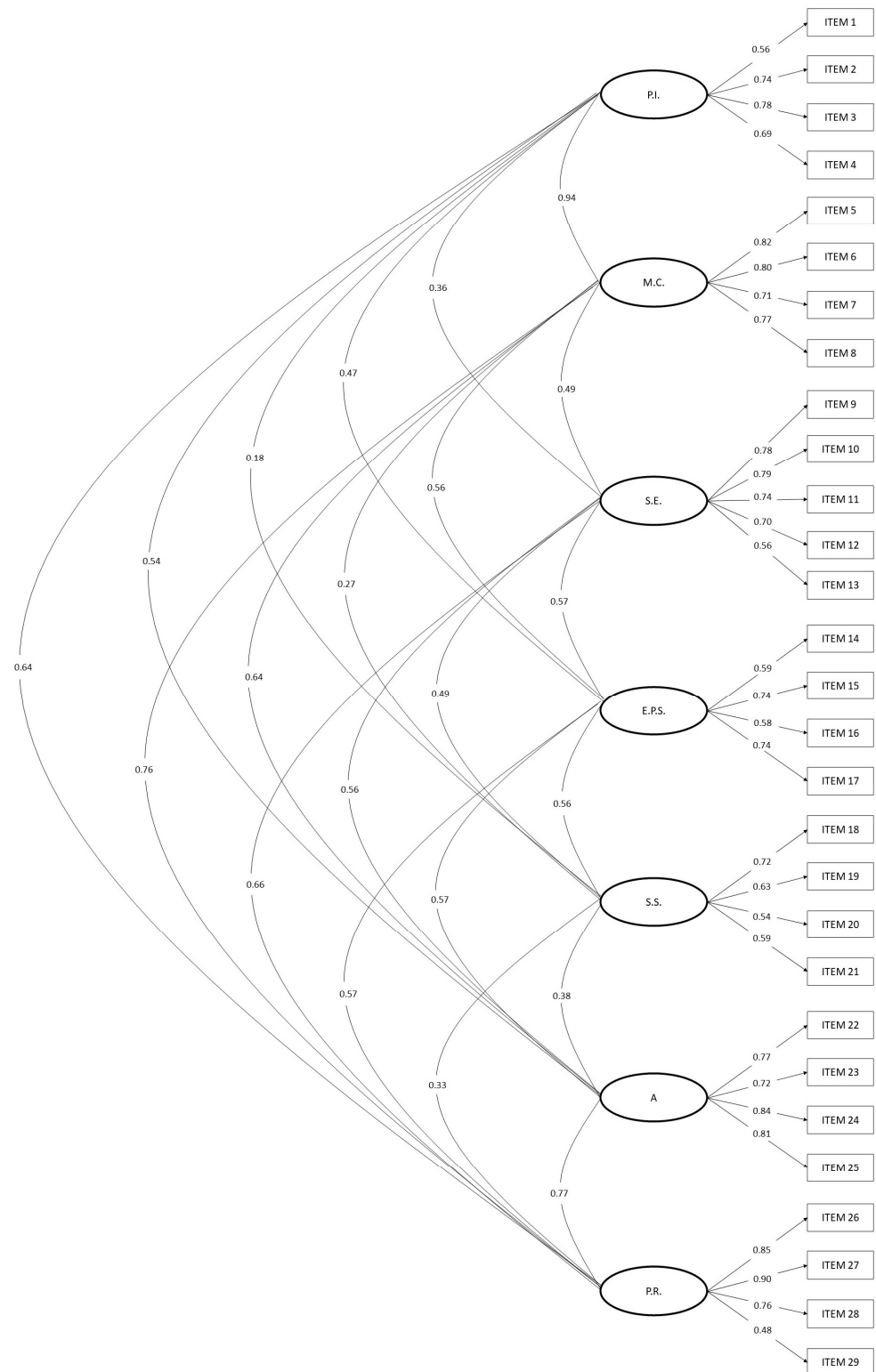
Figure 1. Readiness to change factorial structure and loadings.

3.2.2. Validity

To assess the validity of the RtC scale, we initially computed descriptive statistics for the collected metric variables and assessed their normality in terms of distribution through skewness and kurtosis values (Table 2). This step aimed to determine the most appropriate inferential statistical test to employ.

Table 2. Descriptive statistics.

Variable	Min	Max	Mean (s.d.)	Skew.	Kurt.
RtC: Perceived importance of the problem	6	20	16.24 (2.46)	−0.62	0.61
RtC: Motivation for change	4	20	15.26 (2.72)	−0.61	0.97
RtC: Self-efficacy	7	25	18.30 (3.12)	−0.48	0.97
RtC: Effectiveness of proposed solution	4	20	14.46 (2.49)	−0.36	0.95
RtC: Social support	4	20	13.36 (2.63)	−0.27	0.03
RtC: Action	4	20	14.84 (2.85)	−0.82	1.52
RtC: Perceived readiness	4	20	15.18 (2.64)	−0.70	1.32
Connectedness to nature	26	70	53.39 (7.96)	−0.12	−0.14
CCAS: Belief	9	45	40.48 (4.44)	−1.78	6.90
CCAS: Intention	10	30	24.29 (3.85)	−1.12	1.66
CPRTGP: Attitude	1	5	3.58 (0.94)	−1.03	2.73
CPRTGP: Identity	3	15	9.87 (2.20)	−0.26	0.25
CPRTGP: Purchase intentions	2	10	6.91 (1.87)	−0.23	0.01
PEB: Conservation	7	35	28.86 (3.78)	−1.02	2.20
PEB: Environmental citizenship	5	27	12.37 (3.75)	0.44	0.44
PEB: Food	3	15	9.57 (4.75)	−0.25	−1.46
PEB: Transportation	3	15	9.41 (2.90)	−0.18	−0.41

Note: s.d. = standard deviation; Skew. = skewness; Kurt. = kurtosis; CCAS = climate change attitude survey; CPRTGP = consumers' perceived readiness toward green products.

As shown in Table 2, some of the collected variables do not exhibit a normal distribution. For those variables not adhering to normal distribution, we opted to utilize the non-parametric counterpart of the intended analysis, specifically Spearman's rho.

Our initial step involved testing the relationship that the RtC scale appears to have with variables related to pro-environmental attitude.

As reported in Table 3, all dimensions of the RtC scale maintain a positive and statistically significant relationship with the three variables related to pro-environmental attitudes, except for the dimension of social support in relation to CCAS intention. Quite consistently, the dimensions of perceived importance of the problem, motivation for change, action, and perceived readiness are the most strongly associated with pro-environmental attitude measures, exhibiting effect sizes beyond the relatively large. Subsequently, we conducted the same type of analysis to examine the relationship that the RtC scale has with the two measures of pro-environmental identity (Table 4).

As highlighted by the correlation analysis, the RtC scale consistently exhibits a positive association with the two measures of environmental identity. The dimension of social support is the only one showing correlation coefficients lower than 0.30.

In the final step, we tested the relationship between RtC and pro-environmental intentions and behaviors measures (Table 5). Once again, we observe that nearly every dimension of the RtC is positively associated with pro-environmental intentions and behaviors measures. However, there are exceptions. The most notable one concerns mobility behaviors, for which only four out of seven dimensions of the RtC scale appear to be associated, and furthermore, with relationship strength consistently below the typical threshold (i.e., 0.20). Another exception pertains to the dimension of social support in relation to pro-environmental dietary behaviors. In this case as well, no association was observed.

Table 3. Correlation matrix. RtC dimensions' relationship with pro-environmental attitude measures.

Variable	CCAS: Belief ◆	CCAS: Intention ◆	CPRTGP: Attitude ◆
RtC: Perceived importance of the problem	0.51 ***	0.52 ***	0.31 ***
RtC: Motivation for change	0.45 ***	0.45 ***	0.31 ***
RtC: Self-efficacy	0.26 ***	0.25 ***	0.27 ***
RtC: Effectiveness of proposed solution	0.29 ***	0.31 ***	0.22 ***
RtC: Social support	0.12 **	0.06	0.12 **
RtC: Action ◆	0.43 ***	0.40 ***	0.40 ***
RtC: Perceived readiness ◆	0.45 ***	0.45 ***	0.36 ***

Note: ** = $p < 0.01$; *** = $p < 0.001$; ◆ = the variable relationship with RtC was assessed by Spearman's rho; CCAS = climate change attitude survey.

Table 4. Correlation matrix. RtC dimensions' relationship with pro-environmental identity measures.

Variable	Connectedness to Nature	CPRTGP: Identity ◆
RtC: Perceived importance of the problem	0.40 ***	0.38 ***
RtC: Motivation for change	0.39 ***	0.38 ***
RtC: Self-efficacy	0.39 ***	0.39 ***
RtC: Effectiveness of proposed solution	0.30 ***	0.33 ***
RtC: Social support	0.18 ***	0.19 ***
RtC: Action ◆	0.45 ***	0.50 ***
RtC: Perceived readiness ◆	0.42 ***	0.40 ***

Note: *** = $p < 0.001$; ◆ = the variable relationship with RtC was assessed by Spearman's rho; CPRTGP = consumers' perceived readiness toward green products.

Table 5. Correlation matrix. RtC dimensions' relationship with pro-environmental intentions and behaviors measures.

Variable	CPRTGP: Purchase Intentions	PEB: Conservation ◆	PEB: Environmental Citizenship	PEB: Food ◆	PEB: Transportation
RtC: Perceived importance of the problem	0.35 ***	0.20 ***	0.26 ***	0.30 ***	0.09 *
RtC: Motivation for change	0.38 ***	0.24 ***	0.30 ***	0.29 ***	0.12 **
RtC: Self-efficacy	0.31 ***	0.32 ***	0.30 ***	0.19 ***	0.05
RtC: Effectiveness of proposed solution	0.23 ***	0.21 ***	0.25 ***	0.15 ***	0.07
RtC: Social support	0.20 ***	0.12 *	0.19 ***	0.07	0.04
RtC: Action ◆	0.41 ***	0.37 ***	0.41 ***	0.34 ***	0.15 ***
RtC: Perceived readiness ◆	0.38 ***	0.27 ***	0.30 ***	0.23 ***	0.10 **

Note: * = $p < 0.05$; ** = $p < 0.01$; *** = $p < 0.001$; ◆ = the variable relationship with RtC was assessed by Spearman's rho; CPRTGP = consumers' perceived readiness toward green products.

4. Discussion

The drastic and irreversible changes to the planet necessitate adaptive efforts to address global environmental disasters. This study aimed to validate a measure related to RtC in three separate investigations. In terms of internal validity, following the reduction from the initial pool of 42 items, the 29-item solution identified through exploratory factor

analysis (EFA) was subsequently confirmed by confirmatory factor analysis (CFA). In terms of reliability, the scale shows reliability between good and excellent in both Study 1 and Study 2.

Climate change necessitates adaptive imperatives: entire communities will need to become more resilient to sustain such changes. In this regard, this research assists in the opportunity to improve this potential action, aimed to validate a measure of environmental resilience across three studies. In terms of internal validity, after reducing the initial pool of 42 items, the 29-item solution that emerged through exploratory factor analysis (EFA) was subsequently confirmed by confirmatory factor analysis (CFA).

The hypothesis formulated in this paper regarding the relationship between RtC and green attitudes, i.e., H1, seems to be supported; thus, higher levels of RtC appear to be positively correlated with pro-environmental attitudes. In fact, the correlations that were found ranged from small to large, all in the positive direction, with particularly indicative results for RtC action (0.40), RtC perceived readiness (0.33), and RtC motivation for change (0.30). As a reminder, recall that the guidelines that were used in this research to assess correlations are those described by Gignac and Szodorai [114], which define thresholds for small, typical, and large associations as 0.10, 0.20, and 0.30, respectively. This finding is echoed by the scientific literature, where attitudes toward sustainability considerations are considered an integral part of an individual's life [83–87], in that even ignorance of problems affecting the environment is itself a well-defined attitude, leading to taking (or not taking) certain actions toward (or against) environmental protection, for example [87]. The second hypothesis (i.e., H2) concerning the relationship between RtC and green identity appears to be supported—higher levels of RtC appear to be positively correlated with pro-environmental identity components. The correlations found in this research all have a considerably large value and all are positive, according to the guidelines of Gignac and Szodorai [114] that were adopted in this study—except for the result of RtC social support, whose value is small (0.18). The most indicative associations are RtC action (0.50), RtC perceived readiness (0.43), and RtC motivation for change (0.39), although, as mentioned above, none of the other correlations fall below 0.33, with the exception of social support. This finding is reflected in the scientific literature, where it is found that people who demonstrate a strong self-identity toward the environment are more likely to enact green behaviors and actions [80,88,91]. The literature also discussed how identity can override and prevail over attitudes in cases where our identity role dictates how we behave, irrespective of how we feel about that behavior [115]; this specific finding could explain how both attitude and identity have positive correlations with RtC, but the associations between the latter two are of much stronger value.

Based on our work, intention emerges as one of the fundamental components of readiness to change. Thus, the hypothesis we previously advanced about a probable relationship between intention and readiness is confirmed. H3 is verified, so high levels of intention are associated with high levels of readiness to change. By isolating the seven dimensions of readiness, we can see differences in the effect size of the correlation: there are dimensions that seem to correlate with intention to a greater extent than others (action is the dimension that correlates more, social support is the dimension that correlates less). Our results are in line with the evidence in the literature that depicts intention as a component that cannot fail to bring out in people a readiness to change [24,80,84,94–97]. If people lack intention, they will not undertake any effective change process.

From our work emerges a positive correlation between readiness to change and pro-environmental behavior. Also, H4 is confirmed, so high levels of readiness to change are associated with a greater likelihood of implementing sustainable behaviors. We have divided the PEB into four clusters: conservation, environmental citizenship, food, and transportation. These four clusters correlate with the seven components of readiness to change in a different way. Overall, the PEB environmental citizenship seems to be the one that correlates the most with RtC, while the PEB transport seems to be the one that correlates the least. These results reflect the situation in the literature that reports readiness to change as

fundamental to get people to implement pro-environmental behaviors [11,98–101]. Readiness relates to the mental and physical preparation to accept, embrace, and adopt a specific action.

Visually depicted in Figure 2 are the correlations between the dimensions of the RtC scale and the external variables investigated in this research, the implications of which have been described in this section of the paper (Figure 2).
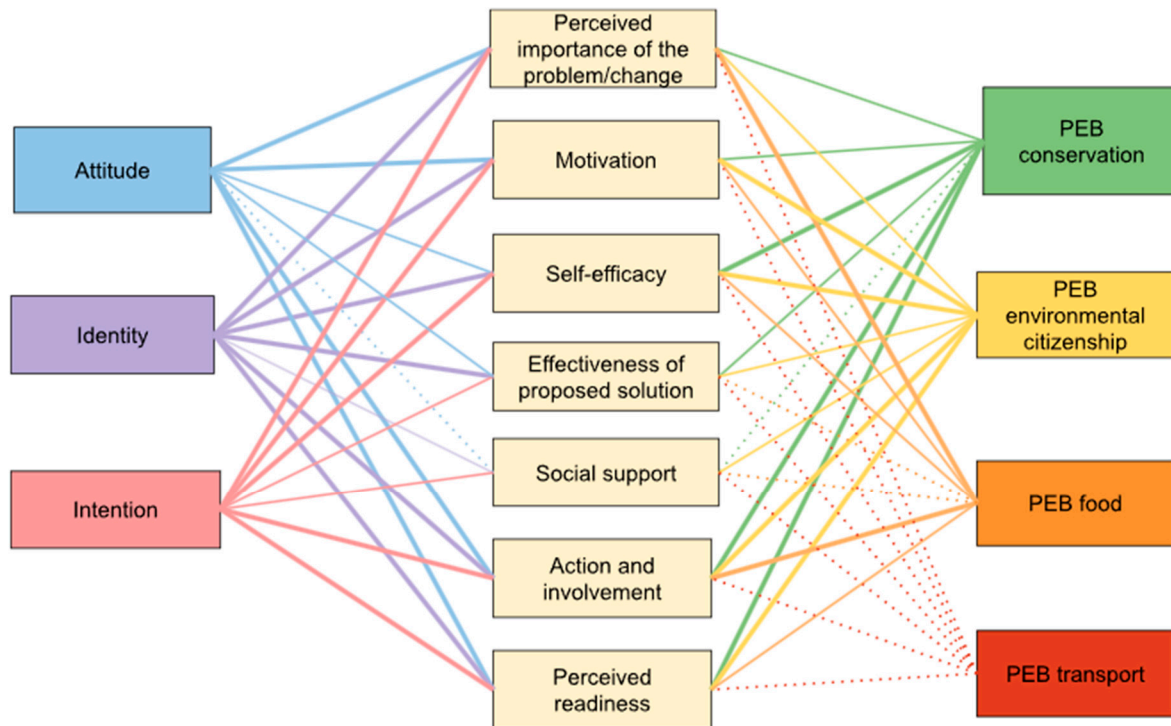

Figure 2. Visualization of the correlations between the seven dimensions of the readiness to change scale and the external variables investigated in this study. Note: thick line = large effect size; thin line = medium effect size; dotted line = small effect size.

4.1. Implications

In this section, we outline the possible implications of our work in the various fields of scientific research application, given the results that have been found regarding the readiness to change scale for sustainability.

This scale can allow us to develop a profile of the individual, identifying those dimensions of RtC that are more developed and those that are less so. This can be useful as a guide for the work, which will focus on further stimulating those dimensions that are already present and strengthening those dimensions that are most lacking.

Among the seven dimensions of RtC, the one that correlates the most with PEBs is action/involvement. This tells us that being engaged in some form with the environmental issue is a very important factor in the likelihood of being ready to change other behaviors in the pro-environmental direction. This spread of activation from one behavior to others can be explained by the principles of Bem's self-perception theory [116].

The dimension of RtC that correlates the least with the behaviors we examined in this study is social support; this may be explained by the fact that the PEBs analyzed require mainly individual activation, for which social support appears to exert a more marginal influence.

On the other hand, as for the correlations between RtC and two external variables of attitude and pro-environmental identity, given the results—which show that identity has more significant correlations with RtC than attitude—it may be more effective to implement interventions that aim to promote green identity than personal attitudes.

Among the four PEBs investigated, the one that seems to correlate most strongly with RtC is environmental citizenship. Since this behavior implies a community activation potential, this allows us to infer that our scale is able to estimate not only individual activation potential but also that of communities, an important feature that not all scales possess.

PEB transport correlates the least with the other components—this can be explained by the fact that this type of behavior, unlike the others, has an external locus of control [117]; this shows us that our scale is sensitive in capturing those behaviors over which the individual has a greater degree of control (internal locus of control), and is less sensitive for those in which the individual has a less pronounced will component (external locus of control).

The scale we proposed in this study can allow us to infer the individual's propensity to enact PEBs; consequently, it can give input to the implementation of interventions aimed at stimulating RtC and, consequently, PEBs.

4.2. Limitations and Future Perspectives

This study, while contributing valuable insights, is not without its limitations. A primary concern is the non-probabilistic nature of participant recruitment, which restricts the generalizability of the findings. Additionally, given the socially sensitive nature of the subject matter, the potential for social desirability bias in participants' responses cannot be discounted. However, the anonymity of data collection may have mitigated this issue to some extent. Finally, because of the correlational nature of the study, no causation can be drawn. Looking towards future research, it is crucial that the proposed model be replicated in diverse settings and with independent samples. This includes adapting the readiness to change scale for use in different linguistic contexts, thereby making the tool accessible to a broader spectrum of professionals and researchers internationally. Moreover, the relationship between the dimensions of readiness to change and pro-environmental behaviors warrants deeper exploration. Future studies could consider additional types of PEBs beyond those currently examined, such as behaviors that not only prevent environmental harm but also create environmental benefits, and sustainable food consumption behaviors related to novel foods. In particular, the latter represent a promising opportunity to improve the sustainability of our food system. Their large-scale adoption could contribute significantly to reducing the environmental impact of the food industry, making food production more efficient and less harmful to the planet (e.g., reduced deforestation and loss of biodiversity; reduced waste production; reduced agricultural pollution; reduced water use; reduced greenhouse gases [118–121]).

5. Conclusions

In conclusion, the two studies conducted and presented in this article provide evidence supporting our conceptualization of the psychological construct of readiness to change. From an initial set of 42 items, and through exploratory and confirmatory factor analysis, we extrapolated a new set of 29 items grouped into seven factors (namely: perceived importance of the problem/change, motivation, self-efficacy, effectiveness of proposed solution, social support, action and involvement, and perceived readiness). We have identified typical to large correlations between our scale and four external validators (pro-environmental identity, green attitudes, sustainable intentions, and pro-environmental behaviors (PEBs). This research substantiates the construct's validity for use in sustainability contexts, adeptly capturing the potential of both individuals and communities to engage in combating climate change. We can assert that the devised scale has the capacity to gauge an individual's inclination towards engaging in PEBs. As a result, it can provide insights for crafting interventions aimed to enhance RtC and thereby promote sustainable behaviors. These findings offer significant implications for both theoretical advancements and practical applications in environmental behavior change.

Appendix A

Table A1. Readiness to change scale. Item ITA (first line); item ENG (second line).

1	Per me questo cambiamento è molto importante. This change is very important for me.
2	Arrivato a questo punto sento la necessità di cambiare. At this point I feel the need to change.
3	Credo sia opportuno modificare il mio comportamento. I think it is appropriate to change my behavior.
4	La mia vita sarebbe peggiore se non cambiassi. My life would be worse if I did not change.
5	Sono determinato a cambiare le mie abitudini. I am determined to change my habits.
6	Mi sento motivato ad intraprendere questo percorso di cambiamento. I feel motivated to undertake this path of change.
7	Ho molti motivi per dover cambiare. I have many reasons to change.
8	Voglio cambiare questo aspetto della mia vita. I want to change this aspect of my life.
9	Ho fiducia nelle mie capacità di cambiare abitudini. I am confident in my ability to change habits.
10	Mi sento in grado di superare ogni sfida relativa al mio cambiamento. I feel capable of overcoming any challenge related to my change.
11	Sarò in grado di rimanere fedele alla mia nuova routine. I will be able to stay true to my new routine.
12	Qualora dovessi avere una battuta d'arresto, sono confidente di riuscire a superarla. If I am going to have a setback, I am confident that I will be able to overcome it.

Table A1. *Cont.*

13	Penso di avere le risorse necessarie a questo cambiamento. I think I have the resources to make this change.
14	Penso che esistano metodi efficaci per affrontare questo cambiamento. I think there are effective ways of dealing with this change.
15	Ho fiducia nei percorsi proposti per supportare il mio cambiamento. I have faith in the paths proposed to support my change.
16	Sono a conoscenza di strategie/tecniche/metodi che mi potrebbero aiutare a cambiare. I am aware of strategies/techniques/methods that could help me change.
17	Penso che quello che mi è stato proposto possa funzionare. I think what was proposed to me might work.
18	Mi sento supportato dalle persone che ho vicine in questo cambiamento. I feel supported by the people close to me in this change.
19	Penso che la mia comunità mi aiuterebbe in questo percorso. I think my community would help me on this path.
20	Le persone che mi stanno attorno approverebbero il mio cambiamento. The people around me would approve of my change.
21	So a chi rivolgermi tra le persone vicine a me per avere un aiuto a cambiare. I know who to turn to among the people close to me for help in changing.
22	Sto già facendo qualcosa per risolvere il mio problema. I am already doing something to solve my problem.
23	Tento talvolta di trovare soluzioni che possano funzionare. Sometimes I try to find solutions that can work.
24	Ho modificato i miei comportamenti per risolvere il problema. I changed my behaviors to fix the problem.
25	Ho iniziato il mio percorso per cercare di fare qualcosa. I started my journey to try to do something.
26	Sono pronto a cambiare. I am ready to change.
27	Credo di essere pronto per modificare le mie abitudini. I think I am ready to change my habits.
28	Ritengo di essere pronto per affrontare il problema. I believe I am ready to tackle the problem.
29	In tutta onestà non sento di essere pronto a modificare la mia vita davvero. In all honesty, I do not feel like I am ready to really change my life.

Note: blue (items 1 to 4) = perceived importance of the problem/change; green (items 5 to 8) = motivation; orange (items 9 to 13) = self-efficacy; purple (items 14 to 17) = effectiveness of proposed solution; red (items 18 to 21) = social support; pink (items 22 to 25) = action and involvement; yellow (items 26 to 29) = perceived readiness.

References

1. Atwoli, L.; Erhabor, G.E.; Gbakima, A.A.; Haileamlak, A.; Ntumba, J.-M.K.; Kigera, J.; Laybourn-Langton, L.; Mash, R.; Muhia, J.; Mulaudzi, F.M.; et al. COP27 Climate Change Conference: Urgent Action Needed for Africa and the World. *Lancet Oncol.* **2022**, *23*, 1486–1488. [CrossRef] [PubMed]
2. van der Linden, S. The Social-Psychological Determinants of Climate Change Risk Perceptions: Towards a Comprehensive Model. *J. Environ. Psychol.* **2015**, *41*, 112–124. [CrossRef]
3. Schwarzer, R. Modeling Health Behavior Change: How to Predict and Modify the Adoption and Maintenance of Health Behaviors. *Appl. Psychol.* **2008**, *57*, 1–29. [CrossRef]
4. Armitage, C.J.; Conner, M. Social Cognition Models and Health Behaviour: A Structured Review. *Psychol. Health* **2000**, *15*, 173–189. [CrossRef]
5. Schwarzer, R. Self-Efficacy in the Adoption and Maintenance of Health Behaviors: Theoretical Approaches and a New Model. In *Self-Efficacy: Thought Control of Action*; Hemisphere Publishing Corp: Washington, DC, USA, 1992; pp. 217–243, ISBN 978-1-56032-269-6.

6. Sutton, S. The Past Predicts the Future: Interpreting Behaviour–Behaviour Relationships in Social Psychological Models of Health Behaviour. In *Social Psychology and Health: European Perspectives*; Avebury/Ashgate Publishing Co: Brookfield, VT, USA, 1994; pp. 71–88, ISBN 978-1-85628-562-9.

7. Sutton, S. Predicting and Explaining Intentions and Behavior: How Well Are We Doing? *J. Appl. Soc. Psychol.* **1998**, *28*, 1317–1338. [CrossRef]

8. Weinstein, N.D. Testing Four Competing Theories of Health-Protective Behavior. *Health Psychol.* **1993**, *12*, 324–333. [CrossRef]

9. Weinstein, N.D. Exploring the Links between Risk Perceptions and Preventive Health Behavior. In *Social Psychological Foundations of Health and Illness*; Blackwell Series in Health Psychology and Behavioral Medicine; Blackwell Publishing: Malden, MA, USA, 2003; pp. 22–53, ISBN 978-0-631-22515-7.

10. Weinstein, N.D. Misleading Tests of Health Behavior Theories. *Ann. Behav. Med.* **2007**, *33*, 1–10. [CrossRef]

11. DiClemente, C.C.; Prochaska, J.O. Self-Change and Therapy Change of Smoking Behavior: A Comparison of Processes of Change in Cessation and Maintenance. *Addict. Behav.* **1982**, *7*, 133–142. [CrossRef] [PubMed]

12. Velicer, W.F.; Prochaska, J.O.; Redding, C.A. Tailored Communications for Smoking Cessation: Past Successes and Future Directions*. *Drug Alcohol Rev.* **2006**, *25*, 49–57. [CrossRef]

13. Prochaska, J.O.; DiClemente, C.C. Stages and Processes of Self-Change of Smoking: Toward an Integrative Model of Change. *J. Consult. Clin. Psychol.* **1983**, *51*, 390–395. [CrossRef]

14. Prochaska, J.O.; DiClemente, C.C.; Norcross, J.C. In Search of How People Change. Applications to Addictive Behaviors. *Am. Psychol.* **1992**, *47*, 1102–1114. [CrossRef] [PubMed]

15. Bandura, A. Cultivate Self-Efficacy for Personal and Organizational Effectiveness. In *Handbook of Principles of Organizational Behavior*; John Wiley & Sons, Ltd.: Hoboken, NJ, USA, 2012; pp. 179–200, ISBN 978-1-119-20642-2.

16. Weinstein, N.D.; Rothman, A.J.; Sutton, S.R. Stage Theories of Health Behavior: Conceptual and Methodological Issues. *Health Psychol.* **1998**, *17*, 290–299. [CrossRef] [PubMed]

17. Sutton, S. Interpreting Cross-Sectional Data on Stages of Change. *Psychol. Health* **2000**, *15*, 163–171. [CrossRef]

18. Armitage, C.J.; Arden, M.A. Exploring Discontinuity Patterns in the Transtheoretical Model: An Application of the Theory of Planned Behaviour. *Br. J. Health Psychol.* **2002**, *7*, 89–103. [CrossRef] [PubMed]

19. Rafferty, A.E.; Jimmieson, N.L.; Armenakis, A.A. Change Readiness: A Multilevel Review. *J. Manag.* **2013**, *39*, 110–135. [CrossRef]

20. Abdel-Ghany, M.M.M. Readiness for Change, Change Beliefs and Resistance to Change of Extension Personnel in the New Valley Governorate about Mobile Extension. *Ann. Agric. Sci.* **2014**, *59*, 297–303. [CrossRef]

21. Fishbein, M. A Theory of Reasoned Action: Some Applications and Implications. *Neb. Symp. Motiv.* **1979**, *27*, 65–116.

22. Fishbein, M.; Ajzen, I. Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research. *Philos. Rhetor.* **1977**, *10*, 130–132.

23. Ajzen, I. From Intentions to Actions: A Theory of Planned Behavior. In *Action Control: From Cognition to Behavior*; Kuhl, J., Beckmann, J., Eds.; Springer: Berlin/Heidelberg, Germany, 1985; pp. 11–39, ISBN 978-3-642-69746-3.

24. Ajzen, I. The Theory of Planned Behavior. *Organ. Behav. Hum. Decis. Process.* **1991**, *50*, 179–211. [CrossRef]

25. Rogers, R.; Cacioppo, J.; Petty, R. Cognitive and Physiological Processes in Fear Appeals and Attitude Change: A Revised Theory of Protection Motivation. In *Social Psychology: A Source Book*; Guilford Press: New York, NY, USA, 1983; pp. 153–177.

26. Sheeran, P. Intention—Behavior Relations: A Conceptual and Empirical Review. *Eur. Rev. Soc. Psychol.* **2002**, *12*, 1–36. [CrossRef]

27. Prochaska, J.O.; Norcross, J.C.; Diclemente, C.C. *Changing for Good: The Revolutionary Program That Explains the Six Stages of Change and Teaches You How to Free Yourself from Bad Habits*, 1st ed.; William Morrow & Co: New York, NY, USA, 1994; ISBN 978-0-688-11263-9.

28. Prochaska, J.O.; Velicer, W.F. The Transtheoretical Model of Health Behavior Change. *Am. J. Health Promot.* **1997**, *12*, 38–48. [CrossRef] [PubMed]

29. Prochaska, J.O.; Velicer, W.F.; Rossi, J.S.; Goldstein, M.G.; Marcus, B.H.; Rakowski, W.; Fiore, C.; Harlow, L.L.; Redding, C.A.; Rosenbloom, D.; et al. Stages of Change and Decisional Balance for 12 Problem Behaviors. *Health Psychol.* **1994**, *13*, 39–46. [CrossRef] [PubMed]

30. Prochaska, J.O.; Velicer, W.F.; DiClemente, C.C.; Fava, J. Measuring Processes of Change: Applications to the Cessation of Smoking. *J. Consult. Clin. Psychol.* **1988**, *56*, 520–528. [CrossRef] [PubMed]

31. Prochaska, J.M.; Prochaska, J.O.; Levesque, D.A. A Transtheoretical Approach to Changing Organizations. *Adm. Policy Ment. Health* **2001**, *28*, 247–261. [CrossRef] [PubMed]

32. McConnaughy, E.A.; Prochaska, J.O.; Velicer, W.F. Stages of Change in Psychotherapy: Measurement and Sample Profiles. *Psychother. Theory Res. Pract.* **1983**, *20*, 368–375. [CrossRef]

33. Miller, W.R.; Tonigan, J.S. *Assessing Drinkers' Motivation for Change: The Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES)*; Addictive Behaviors: Readings on Etiology, Prevention, and Treatment; American Psychological Association: Washington, DC, USA, 1997; p. 369, ISBN 978-1-55798-468-5.

34. Cox, W.M.; Blount, J.P.; Bair, J.; Hosier, S.G. Motivational Predictors of Readiness to Change Chronic Substance Abuse. *Addict. Res.* **2000**, *8*, 121–128. [CrossRef]

35. Klinger, E.; Cox, W.M.; Blount, J.P. The Motivational Structure Questionnaire, Personal Concerns Inventory, and their variants: Psychometric properties. In *Handbook of Motivational Counseling: Goal-Based Approaches to Assessment and Intervention with Addiction and Other Problems*, 2nd ed.; Cox, W.M., Klinger, E., Eds.; Wiley Blackwell: Hoboken, NJ, USA, 2011; pp. 206–232. [CrossRef]

36. Ryder, D. Deciding to Change: Enhancing Client Motivation to Change Behaviour. *Behav. Chang.* **1999**, *16*, 165–174. [CrossRef]

37. Draycott, S.; Dabbs, A. Cognitive Dissonance 2: A Theoretical Grounding of Motivational Interviewing. *Br. J. Clin. Psychol.* **1998**, *37*, 355–364. [CrossRef] [PubMed]

38. Miller, W.R. Increasing Motivation for Change. In *Handbook of Alcoholism Treatment Approaches: Effective Alternatives, 2nd ed*; Allyn & Bacon: Needham Heights, MA, USA, 1995; pp. 89–104, ISBN 978-0-205-16376-2.

39. Miller, W.R.; Rollnick, S. *Motivational Interviewing: Preparing People to Change Addictive Behavior*; The Guilford Press: New York, NY, USA, 1991; pp. xvii, 348, ISBN 978-0-89862-566-0.

40. Cunningham, C.E.; Woodward, C.A.; Shannon, H.S.; MacIntosh, J.; Lendrum, B.; Rosenbloom, D.; Brown, J. Readiness for Organizational Change: A Longitudinal Study of Workplace, Psychological and Behavioural Correlates. *J. Occup. Organ. Psychol.* **2002**, *75*, 377–392. [CrossRef]

41. Wittenstein, R.D. Factors Influencing Individual Readiness for Change in a Health Care Environment. Ph.D. Thesis, George Washington University, Washington, DC, USA, 2008.

42. Fasbender, U. Outcome Expectancies. In *Encyclopedia of Personality and Individual Differences*; Zeigler-Hill, V., Shackelford, T.K., Eds.; Springer International Publishing: Cham, Switzerland, 2020; pp. 3377–3379, ISBN 978-3-319-24612-3.

43. Bandura, A. Social Cognitive Theory: An Agentic Perspective. *Annu. Rev. Psychol.* **2001**, *52*, 1–26. [CrossRef]

44. Locke, E.A.; Latham, G.P. *A Theory of Goal Setting & Task Performance*; A Theory of Goal Setting & Task Performance; Prentice-Hall, Inc: Englewood Cliffs, NJ, USA, 1990; pp. xviii, 413, ISBN 978-0-13-913138-7.

45. Bandura, A. *Social Foundations of Thought and Action: A Social Cognitive Theory*; Social Foundations of Thought and Action: A Social Cognitive Theory; Prentice-Hall, Inc: Englewood Cliffs, NJ, USA, 1986; pp. xiii, 617, ISBN 978-0-13-815614-5.

46. Witte, K. Putting the Fear Back into Fear Appeals: The Extended Parallel Process Model. *Commun. Monogr.* **1992**, *59*, 329–349. [CrossRef]

47. Tannenbaum, M.B.; Hepler, J.; Zimmerman, R.S.; Saul, L.; Jacobs, S.; Wilson, K.; Albarracín, D. Appealing to Fear: A Meta-Analysis of Fear Appeal Effectiveness and Theories. *Psychol. Bull.* **2015**, *141*, 1178–1204. [CrossRef]

48. Schwarzer, R.; Lippke, S.; Luszczynska, A. Mechanisms of Health Behavior Change in Persons with Chronic Illness or Disability: The Health Action Process Approach (HAPA). *Rehabil. Psychol.* **2011**, *56*, 161–170. [CrossRef]

49. Allen, N.A. Social Cognitive Theory in Diabetes Exercise Research: An Integrative Literature Review. *Diabetes Educ.* **2004**, *30*, 805–819. [CrossRef]

50. McAuley, E.; Jerome, G.J.; Elavsky, S.; Marquez, D.X.; Ramsey, S.N. Predicting Long-Term Maintenance of Physical Activity in Older Adults. *Prev. Med.* **2003**, *37*, 110–118. [CrossRef]

51. Plotnikoff, R.C.; Lippke, S.; Courneya, K.S.; Birkett, N.; Sigal, R.J. Physical Activity and Social Cognitive Theory: A Test in a Population Sample of Adults with Type 1 or Type 2 Diabetes. *Appl. Psychol.* **2008**, *57*, 628–643. [CrossRef]

52. Hanna, F.J. *Therapy with Difficult Clients: Using the Precursors Model to Awaken Change: Using Precursors Model to Awaken Change*, 1st ed.; American Psychological Association: Washington, DC, USA, 2001.

53. Narayan, A.; Steele-Johnson, D.; Delgado, K.M.; Cole, P.A. Differential Effects of Pretraining Influences on Readiness to Change. *J. Psychol.* **2007**, *141*, 47–60. [CrossRef]

54. Lippke, S.; Ziegelmann, J.P.; Schwarzer, R. Initiation and Maintenance of Physical Exercise: Stage-Specific Effects of a Planning Intervention. *Res. Sports Med.* **2004**, *12*, 221–240. [CrossRef]

55. Luszczynska, A. An Implementation Intentions Intervention, the Use of a Planning Strategy, and Physical Activity after Myocardial Infarction. *Soc. Sci. Med.* **2006**, *62*, 900–908. [CrossRef]

56. Sniehotta, F.F.; Scholz, U.; Schwarzer, R. Action Plans and Coping Plans for Physical Exercise: A Longitudinal Intervention Study in Cardiac Rehabilitation. *Br. J. Health Psychol.* **2006**, *11*, 23–37. [CrossRef]

57. Sniehotta, F.F.; Schwarzer, R.; Scholz, U.; Schüz, B. Action Planning and Coping Planning for Long-Term Lifestyle Change: Theory and Assessment. *Eur. J. Soc. Psychol.* **2005**, *35*, 565–576. [CrossRef]

58. Ziegelmann, J.P.; Lippke, S.; Schwarzer, R. Adoption and Maintenance of Physical Activity: Planning Interventions in Young, Middle-Aged, and Older Adults. *Psychol. Health* **2006**, *21*, 145–163. [CrossRef] [PubMed]

59. Biener, L.; Abrams, D.B. The Contemplation Ladder: Validation of a Measure of Readiness to Consider Smoking Cessation. *Health Psychol.* **1991**, *10*, 360–365. [CrossRef] [PubMed]

60. Moyers, T.B.; Martin, T.; Houck, J.M.; Christopher, P.J.; Tonigan, J.S. From In-Session Behaviors to Drinking Outcomes: A Causal Chain for Motivational Interviewing. *J. Consult. Clin. Psychol.* **2009**, *77*, 1113–1124. [CrossRef] [PubMed]

61. LaBrie, J.W.; Quinlan, T.; Schiffman, J.E.; Earleywine, M.E. Performance of Alcohol and Safer Sex Change Rulers Compared With Readiness to Change Questionnaires. *Psychol. Addict. Behav.* **2005**, *19*, 112–115. [CrossRef] [PubMed]

62. Kwahk, K.-Y.; Kim, H.-W. Managing Readiness in Enterprise Systems-Driven Organizational Change. *Behav. Inf. Technol.* **2008**, *27*, 79–87. [CrossRef]

63. Meyer, J.P.; Allen, N.J. A Three-Component Conceptualization of Organizational Commitment. *Hum. Resour. Manag. Rev.* **1991**, *1*, 61–89. [CrossRef]

64. Venkatesh, V.; Morris, M.G.; Davis, G.B.; Davis, F.D. User Acceptance of Information Technology: Toward a Unified View. *MIS Q.* **2003**, *27*, 425–478. [CrossRef]

65. Zeng, J.; Jiang, M.; Yuan, M. Environmental Risk Perception, Risk Culture, and Pro-Environmental Behavior. *Int. J. Environ. Res. Public Health* **2020**, *17*, 1750. [CrossRef]

66. Bradley, G.L.; Babutsidze, Z.; Chai, A.; Reser, J.P. The Role of Climate Change Risk Perception, Response Efficacy, and Psychological Adaptation in pro-Environmental Behavior: A Two Nation Study. *J. Environ. Psychol.* **2020**, *68*, 101410. [CrossRef]

67. van Valkengoed, A.M.; Steg, L. Meta-Analyses of Factors Motivating Climate Change Adaptation Behaviour. *Nat. Clim. Chang.* **2019**, *9*, 158–163. [CrossRef]

68. Tagkaloglou, S.; Kasser, T. Increasing Collaborative, pro-Environmental Activism: The Roles of Motivational Interviewing, Self-Determined Motivation, and Self-Efficacy. *J. Environ. Psychol.* **2018**, *58*, 86–92. [CrossRef]

69. Osbaldiston, R.; Sheldon, K.M. Promoting Internalized Motivation for Environmentally Responsible Behavior: A Prospective Study of Environmental Goals. *J. Environ. Psychol.* **2003**, *23*, 349–357. [CrossRef]

70. Afsar, B.; Badir, Y.; Kiani, U.S. Linking Spiritual Leadership and Employee Pro-Environmental Behavior: The Influence of Workplace Spirituality, Intrinsic Motivation, and Environmental Passion. *J. Environ. Psychol.* **2016**, *45*, 79–88. [CrossRef]

71. Lauren, N.; Fielding, K.S.; Smith, L.; Louis, W.R. You Did, so You Can and You Will: Self-Efficacy as a Mediator of Spillover from Easy to More Difficult pro-Environmental Behaviour. *J. Environ. Psychol.* **2016**, *48*, 191–199. [CrossRef]

72. Emery, D.N. Investigating Self-Affirmation, Self-Efficacy and Response-Efficacy in Relation to Pro-Environmental Behavior. Ph.D. Thesis, Towson University, Towson, MD, USA, 2013.

73. Abraham, J.; Pane, M.; Chairiyani, R. An Investigation on Cynicism and Environmental Self-Efficacy as Predictors of Pro-Environmental Behavior. *Psychology* **2015**, *6*, 234–242. [CrossRef]

74. Wan, Q.; Du, W. Social Capital, Environmental Knowledge, and Pro-Environmental Behavior. *Int. J. Environ. Res. Public Health* **2022**, *19*, 1443. [CrossRef]

75. Shi, J.; Lu, C.; Wei, Z. Effects of Social Capital on Pro-Environmental Behaviors in Chinese Residents. *Sustainability* **2022**, *14*, 13855. [CrossRef]

76. Yu, T.-K.; Chang, Y.-J.; Chang, I.-C.; Yu, T.-Y. A Pro-Environmental Behavior Model for Investigating the Roles of Social Norm, Risk Perception, and Place Attachment on Adaptation Strategies of Climate Change. *Environ. Sci. Pollut. Res.* **2019**, *26*, 25178–25189. [CrossRef]

77. Huang, P.-C.; Lin, K.-S. Study on the Correlation between Social Norm and Pro-Environmental Behavior of Employees in Health Care Industry—Viewpoint of Personality Trait. *Rev. Cercet. Interv. Soc.* **2020**, *71*, 187–198. [CrossRef]

78. Thøgersen, J.; Noblet, C. Does Green Consumerism Increase the Acceptance of Wind Power? *Energy Policy* **2012**, *51*, 854–862. [CrossRef]

79. Van der Werff, E.; Steg, L.; Keizer, K. I Am What I Am, by Looking Past the Present: The Influence of Biospheric Values and Past Behavior on Environmental Self-Identity. *Environ. Behav.* **2014**, *46*, 626–657. [CrossRef]

80. Arli, D.; Tan, L.P.; Tjiptono, F.; Yang, L. Exploring Consumers' Purchase Intention towards Green Products in an Emerging Market: The Role of Consumers' Perceived Readiness. *Int. J. Consum. Stud.* **2018**, *42*, 389–401. [CrossRef]

81. Tan, L.P.; Johnstone, M.-L.; Yang, L. Barriers to Green Consumption Behaviours: The Roles of Consumers' Green Perceptions. *Australas. Mark. J.* **2016**, *24*, 288–299. [CrossRef]

82. Tjiptono, F. Examining the Challenges of Responsible Consumption in an Emerging Market. In *Ergonomics and Human Factors for a Sustainable Future: Current Research and Future Possibilities*; Thatcher, A., Yeow, P.H.P., Eds.; Springer: Singapore, 2018; pp. 299–327, ISBN 978-981-10-8072-2.

83. Haqq, Z.N.; Natsir, M. Three Components of Readiness to Change: Communication of Change and Change-Efficacy as Antecendents. *Perisai Islam. Bank. Financ. J.* **2019**, *3*, 33–44. [CrossRef]

84. Bouckenooghe, D.; Devos, G.; Van den Broeck, H. Organizational Change Questionnaire–Climate of Change, Processes, and Readiness: Development of a New Instrument. *J. Psychol.* **2009**, *143*, 559–599. [CrossRef] [PubMed]

85. Choi, M. Employees' Attitudes toward Organizational Change: A Literature Review. *Hum. Resour. Manag.* **2011**, *50*, 479–500. [CrossRef]

86. Holt, D.T.; Vardaman, J.M. Toward a Comprehensive Understanding of Readiness for Change: The Case for an Expanded Conceptualization. *J. Chang. Manag.* **2013**, *13*, 9–18. [CrossRef]

87. Valkila, N.; Saari, A. Consumer Panel on the Readiness of Finns to Behave in a More Pro-Environmental Manner. *Sustainability* **2012**, *4*, 1561–1579. [CrossRef]

88. Schwartz, S.J.; Montgomery, M.J.; Briones, E. The Role of Identity in Acculturation among Immigrant People: Theoretical Propositions, Empirical Questions, and Applied Recommendations. *Hum. Dev.* **2006**, *49*, 1–30. [CrossRef]

89. Herman, W.E. Identity Formation. In *Encyclopedia of Child Behavior and Development*; Goldstein, S., Naglieri, J.A., Eds.; Springer: Boston, MA, USA, 2011; pp. 779–781, ISBN 978-0-387-79061-9.

90. Franco-Zamudio, J.; Dorton, H. Collective Identity. In *Encyclopedia of Critical Psychology*; Teo, T., Ed.; Springer: New York, NY, USA, 2014; pp. 256–259, ISBN 978-1-4614-5583-7.

91. Anthis, K.; LaVoie, J.C. Readiness to Change: A Longitudinal Study of Changes in Adult Identity. *J. Res. Personal.* **2006**, *40*, 209–219. [CrossRef]

92. White, K.M.; Hyde, M.K. The Role of Self-Perceptions in the Prediction of Household Recycling Behavior in Australia. *Environ. Behav.* **2012**, *44*, 785–799. [CrossRef]

93. Whitmarsh, L.; O'Neill, S. Green Identity, Green Living? The Role of pro-Environmental Self-Identity in Determining Consistency across Diverse pro-Environmental Behaviours. *J. Environ. Psychol.* **2010**, *30*, 305–314. [CrossRef]

94. Bernerth, J. Expanding Our Understanding of the Change Message. *Hum. Resour. Dev. Rev.* **2004**, *3*, 36–52. [CrossRef]

95. Dalton, C.C.; Gottlieb, L.N. The Concept of Readiness to Change. *J. Adv. Nurs.* **2003**, *42*, 108–117. [CrossRef] [PubMed]
96. Fatima, M.; Riaz, A.; Mahmood, H.Z.; Usman, M. Linking Employees Change-Related Self-Efficacy, Change Readiness and Commitment to Change. *Pak. J. Commer. Soc. Sci. (PJCSS)* **2020**, *14*, 334–367.
97. Chanda, R.; Pabalkar, V. Exploring the Factors That Lead a Positive Behavior in Indian Consumers Purchasing a Sustainable-Fuel Efficient Two Wheeler. *Int. J. Innov. Technol. Explor. Eng.* **2019**, *8*, 9.
98. Walinga, J. Toward a Theory of Change Readiness: The Roles of Appraisal, Focus, and Perceived Control. *J. Appl. Behav. Sci.* **2008**, *44*, 315–347. [CrossRef]
99. Holt, D.T.; Armenakis, A.A.; Feild, H.S.; Harris, S.G. Readiness for Organizational Change: The Systematic Development of a Scale. *J. Appl. Behav. Sci.* **2007**, *43*, 232–255. [CrossRef]
100. Saulick, P.; Bekaroo, G.; Bokhoree, C.; Beeharry, Y.D. Investigating Pro-Environmental Behaviour among Students: Towards an Integrated Framework Based on the Transtheoretical Model of Behaviour Change. *Environ. Dev. Sustain.* **2024**, *26*, 6751–6780. [CrossRef]
101. DiClemente, C.C.; Prochaska, J.O. Toward a Comprehensive, Transtheoretical Model of Change: Stages of Change and Addictive Behaviors. In *Treating Addictive Behaviors, 2nd ed*; Applied Clinical Psychology; Plenum Press: New York, NY, USA, 1998; pp. 3–24, ISBN 978-0-306-45852-1.
102. de Winter, J.C.F.; Dodou, D.; Wieringa, P.A. Exploratory Factor Analysis With Small Sample Sizes. *Multivar. Behav. Res.* **2009**, *44*, 147–181. [CrossRef] [PubMed]
103. Ferguson, E.; Cox, T. Exploratory Factor Analysis: A Users'Guide. *Int. J. Sel. Assess.* **1993**, *1*, 84–94. [CrossRef]
104. Comrey, A.L. Factor-Analytic Methods of Scale Development in Personality and Clinical Psychology. *J. Consult. Clin. Psychol.* **1988**, *56*, 754–761. [CrossRef] [PubMed]
105. Faul, F.; Erdfelder, E.; Buchner, A.; Lang, A.-G. Statistical Power Analyses Using G*Power 3.1: Tests for Correlation and Regression Analyses. *Behav. Res. Methods* **2009**, *41*, 1149–1160. [CrossRef] [PubMed]
106. Faul, F.; Erdfelder, E.; Lang, A.-G.; Buchner, A. G*Power 3: A Flexible Statistical Power Analysis Program for the Social, Behavioral, and Biomedical Sciences. *Behav. Res. Methods* **2007**, *39*, 175–191. [CrossRef] [PubMed]
107. Mayer, F.S.; Frantz, C.M. The Connectedness to Nature Scale: A Measure of Individuals' Feeling in Community with Nature. *J. Environ. Psychol.* **2004**, *24*, 503–515. [CrossRef]
108. Christensen, R.; Knezek, G. The Climate Change Attitude Survey: Measuring Middle School Student Beliefs and Intentions to Enact Positive Environmental Change. *Int. J. Environ. Sci. Educ.* **2015**, *10*, 773–788.
109. Markle, G.L. Pro-Environmental Behavior: Does It Matter How It's Measured? Development and Validation of the Pro-Environmental Behavior Scale (PEBS). *Hum. Ecol.* **2013**, *41*, 905–914. [CrossRef]
110. Byrne, B.M. *Structural Equation Modeling with Mplus: Basic Concepts, Applications, and Programming*; Routledge: New York, NY, USA, 2011; ISBN 978-0-203-80764-4.
111. Hu, L.; Bentler, P.M. Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria versus New Alternatives. *Struct. Equ. Model. A Multidiscip. J.* **1999**, *6*, 1–55. [CrossRef]
112. Cattell, R.B. The Scree Test for the Number of Factors. *Multivar. Behav. Res.* **1966**, *1*, 245–276. [CrossRef]
113. Kaiser, H.F. The Application of Electronic Computers to Factor Analysis. *Educ. Psychol. Meas.* **1960**, *20*, 141–151. [CrossRef]
114. Gignac, G.E.; Szodorai, E.T. Effect Size Guidelines for Individual Differences Researchers. *Personal. Individ. Differ.* **2016**, *102*, 74–78. [CrossRef]
115. Charng, H.-W.; Piliavin, J.A.; Callero, P.L. Role Identity and Reasoned Action in the Prediction of Repeated Behavior. *Soc. Psychol. Q.* **1988**, *51*, 303–317. [CrossRef]
116. Bem, D.J. Self-Perception. In *Advances in Experimental Social Psychology*; Academic Press: Cambridge, MA, USA, 1972; Volume 6, pp. 1–62.
117. Rotter, J.B. Generalized Expectancies for Internal versus External Control of Reinforcement. *Psychol. Monogr. Gen. Appl.* **1966**, *80*, 1–28. [CrossRef]
118. Sánchez-Muros, M.-J.; Barroso, F.G.; Manzano-Agugliaro, F. Insect Meal as Renewable Source of Food for Animal Feeding: A Review. *J. Clean. Prod.* **2014**, *65*, 16–27. [CrossRef]
119. Oonincx, D.G.A.B.; van Itterbeeck, J.; Heetkamp, M.J.W.; van den Brand, H.; van Loon, J.J.A.; van Huis, A. An Exploration on Greenhouse Gas and Ammonia Production by Insect Species Suitable for Animal or Human Consumption. *PLoS ONE* **2010**, *5*, e14445. [CrossRef]
120. Vinnari, M.; Tapio, P. Sustainability of Diets: From Concepts to Governance. *Ecol. Econ.* **2012**, *74*, 46–54. [CrossRef]
121. Tucker, C. Insects, Offal, Feet and Faces: Acquiring New Tastes in New Zealand? *N. Z. Sociol.* **2013**, *28*, 101–122.