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sustainability

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Systematic Review

Closing the Gap: The Tripartite Structure of Sustainability as a Tool for Sustainable Education—A Systematic Literature Review

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Abstract: (1) In an era where sustainable behavior is increasingly crucial, understanding the discrepancy between individuals' sustainability-oriented values and their actual behaviors, known as the inner–outer gap, is vital. This systematic literature review explores the potential of the Tripartite Structure of Sustainability (TSS) framework to address this gap within the context of sustainable education. By reviewing the literature from the APA, ERIC, and Web of Science databases, searched on 25 October 2020, the factors influencing sustainable actions were systematically examined. Articles had to be relevant to the topic (sustainability, morality in relation to sustainability, or morality in general) and report on empirically validated factors that have an impact on the inner-outer gap. (2) By employing a qualitative content analysis approach, 56 articles over a 15-year period were analyzed, identifying 83 factors that either bridged or reinforced the inner–outer gap. These factors were categorized within the TSS framework, which segments sustainability-oriented actions into individual, social, and self-transcendent domains, alongside their activation points: stable, situational, or automated. (3) The analysis revealed that self-focused factors often reinforce the gap, suggesting they are a hindrance to sustainable behavior. Conversely, self-transcendent factors consistently bridged the gap, promoting sustainability. Social factors showed variable impacts based on the ethical and sustainable context they were placed in, suggesting that the social environment's orientation significantly influences sustainable behavior. (4) This study concludes that the TSS framework offers a promising approach to advancing education for sustainable development (ESD) and contributes insights into how to promote the required paradigm shift towards holistic and interconnected perspectives.

Keywords: education for sustainable development; systematic literature review; inner–outer gap; ego development theory; educational psychology; judgment–action gap; intention–action gap; value–action gap; knowledge–action gap

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1. How Can We Close the Gap?

It is common knowledge that we face multiple irreversible environmental tipping points which, when reached, will lead to catastrophic results for humanity [1,2]. If education can act as an active instrument of social change and progress [3], the most important question of our times for educators today has to be: how can we guide individuals to act more sustainably [4]? The literature shows ample evidence that educational efforts concerning the preservation of the environment are failing to transform existing knowledge, attitudes, and values into action [5–12]. This gap between internal processes such as judgements, attitudes, intentions, knowledge and values, and external actions (inner–outer gap) must be seen as the main problem in education for sustainable development, not the lack of knowledge or resources.

Striving to achieve success in education for sustainable development (ESD), educators try to aim for realistic goals such as teaching about and practicing recycling. However,

these kinds of goals have raised concerns regarding their effectiveness, whereby researchers often refer to Meadows' exploration of strategic interventions within systems that yield the most substantial influence [13]. Meadows introduced the concept of profound leverage points: transformative shifts are harder to achieve, yet their effects are so profound that the endeavor is inherently worthwhile. According to Meadows, there are shallow leverage points in a system like changes in materials and processes, but also deeper leverage points like changes in design (for example, by redefining goals or information flows) and, most effectively, changes in intentions such as mindsets and paradigms. In this line and addressing the inner–outer gap, Horcea-Milcu and colleagues call for knowledge on how transformation research can engage with values as leverage points (2022) and Woiwode and colleagues call for "empirical connections between people's inner dimensions and transformation, and the impact on actual behavior" [14] (p. 854). Not only the connection, but also the nature of deeper leverage points themselves is under-researched, as Abson and colleagues observed in 2017. Nevertheless, since then, significant developments have been made. Recently conducted research shows the nature of helpful paradigms and mindsets: individuals demonstrate a heightened propensity for sustainable behavior under the influence of the following aspects:

- A better human–nature connectedness [15] (for contributions to the Special Issue of *Ecosystems and people*, 2021, see [16]);
- Being mindful [17];
- A dark green humility [18];
- A focus on inner worlds and inner transformation [14,19,20]—see also the initiative "Inner Development Goals", https://www.innerdevelopmentgoals.org/ (accessed on 20 April 2024).

What unites the paradigms that have been shown to be helpful is that they are all distance themselves from—as Böhme and colleagues put it—the current mechanistic paradigm in the West, which is "characterized by rationalism, reductionism, empiricism, dualism, and determinism" [21] (p. 2065). Böhme and colleagues argue that the mechanistic paradigm operates under the misconception that an observer can be independent from the observed system, which is never the case. As a result, this old paradigm fails to understand and successfully address the complex systemic challenges typical in a globalized world. What is currently needed is wise action [22] in our volatile, uncertain, complex, and ambiguous times [23]. The relevant literature therefore suggests a shift to a relational and holistic understanding of interconnected living systems. If this paradigm is needed to act sustainably, the next question is how can we educate towards this paradigm?

2. Theory

2.1. Ego Development Theory, Domain Theory and Research on Automatisms

To answer this question, we can benefit from the findings in ego development research (gathered in [24–26]). It claims that individuals have a developmental center of gravity in their thinking, doing, and being—similar to different paradigms—that can be measured. Individuals go through different developmental stages one after the other, following the line of three main shifts (preconventional, conventional, and postconventional understandings of the world). The overview of the nine stages formulated by Cook-Greuter—based on [27]—can be found in Figure 1. In our view, the vertical green line can be seen as representing where the old paradigm in sustainability education begins to shift to the new.

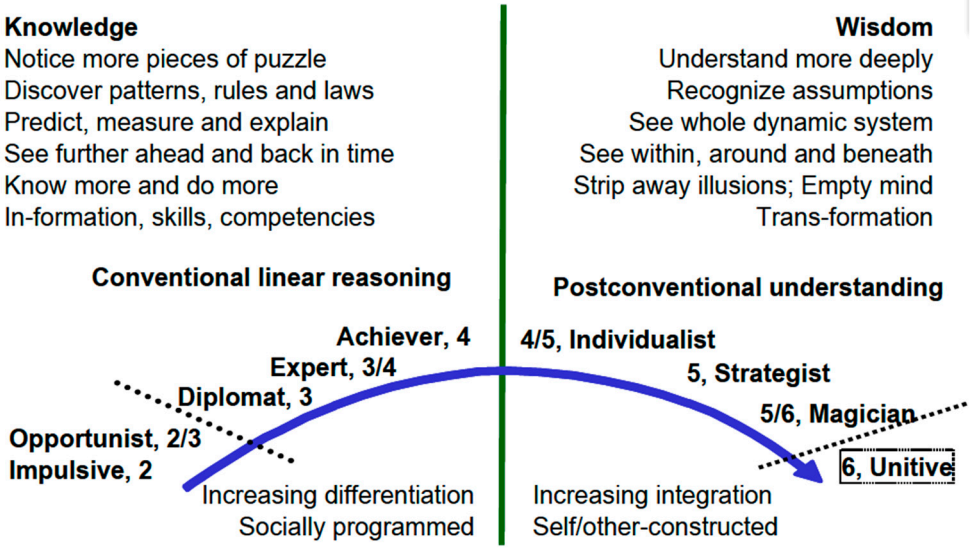

Figure 1. The arch of increasing differentiation and integration (Figure 3 in [27] (p. 16)).

Recognizing the fact that it is a developmental process, education would have to support the ego development of individuals step by step to guide them to the required paradigm. To gain a better understanding of the theoretical construct of the stages, some assumptions that ego development shares with other constructive theories of development ([27] p. 2, in modified order) are quoted in the following:

- People's stage of development influences what they notice and can become aware of and, therefore, what they can describe, articulate, cultivate, influence, and change.
- All stage descriptions are idealizations that no human being fits entirely.
- As healthy development unfolds, autonomy, freedom, tolerance for difference, and ambiguity, as well as flexibility, self-awareness, and skill in interacting with the environment, increase while defenses decrease.
- Later stages are reached only by journeying through the earlier stages. Once a stage has been traversed, it remains a part of the individual's response repertoire, even when more complex, later stages are adopted as primary lenses to look at experience.
- A person who has reached a later stage can understand earlier world views, but a person at an earlier stage cannot understand the later ones.

These notions indicate that it is not only that individuals in earlier stages (like nearly all students in K12) *cannot* yet impart the above-mentioned paradigms, but what is more, they have no capacity to really understand it. The same problem might appear for adults, as Binder's collection of partly representative studies on the distribution of ego-levels shows; only 7 to 12% of adults are in post-conventional stages of ego development [25]. To change education towards these personal development goals (vertical development [27]) would necessitate fundamental changes in educational systems. At the moment, education in most countries seems to be concentrated mainly on competencies/employability [28], which is also labeled as horizontal development [27]. Interestingly, to change the focus towards personal development does not contradict the development of skills or employability; it was shown that students at a later ego development stage have better academic results [29] and individuals at a later stage are more successful leaders in companies [25]. Also, human resource managers complain that students in schools are not learning what are described to be middle- or late-stage propensities [22]. It seems like focusing on vertical development in education would prove to be helpful in every direction.

Taking this into account, it is not surprising that a range of educational attempts and programs with the goal of vertical development/a shift to the new paradigm (see the Introduction) exist. Some of them are, for example, collected in the book "*Revolutionizing Sustainability Education*" edited by Ivanova and Rimanoczy [30]. From our observations,

these initiatives mostly have the signature of case studies, and the field of "education towards a paradigm change" does not yet have a clear direction or concrete foundational relationships. More understanding of how paradigmatic shifts happen in individuals is clearly needed. To contribute to this endeavor, we investigate the concrete influence that the different foci in the stages (the main bundles preconventional, conventional, and postconventional) has on sustainable action. As the matter of sustainable action is a very relevant one, it would be important to understand if people even in earlier stages can be expected to act sustainably or to understand better what the respective *reasons for acting or not acting sustainably under the respective paradigms* are.

But additionally, one would have to take into account the research of Domain theorists, who found out that despite individuals having a center of gravity (a certain paradigm/stage), they draw from different domains/give reasons for their behavior that can be assigned to paradigms in different stages depending on the given *situation*. In addition, the vast majority of human behavior seems to be guided by *automatisms* like heuristics or habits [31–33]. Therefore, which focus/emphasis becomes active seems to depend on different factors that can be summarized in three activation points: stably inherent circumstances, situational circumstances, and automatisms. To explore the point of intersection systematically is the aim of this article, with the goal of making use of the rich knowledge of adult development theories in the exploration of how to build a model (the Tripartite Structure of Sustainability) that can be used in practice to foster sustainable development.

Situational: An action is performed primarily due to the values and attitudes of a person or group, which is shaped by personal convictions, social norms, and the situation. The action is usually manipulable, closely interwoven with the action and recognized as important. In Meadows' model, this situational activity is a shallow parameter in which we extract empirically valid factors that have an influence on the inner-outer gap and subscribe them via a qualitative content analysis to the Tripartite Structure of Sustainability. After the presentation of the results, we will discuss them by especially focusing and learning from relict factors. In the conclusion, we focus on the possible impacts of this article on education and research.

Automated: An action is performed primarily because of a programmed system in a person, like psychological mechanisms, biases, emotions, habits, or scripts. The mechanism itself goes mostly unrecognized, but is similar for all humans. The mechanism itself is not changeable, whereas the trigger and outplay are inter- and intra-individually different. Situational activation and automatisms are closely interwoven because situations outside a person are "picked up" by mechanisms inside—like aroused emotions of a student because of very strict recycling regulations. Regarding the higher cost of a sustainable product, a person might react to the higher price with loss aversion. A higher cost is seen as a situational factor and loss aversion as an automatism in this case. In Meadow's model, automatisms can be seen as deep leverage points in the human system, such as a design or structure in the background that manages feedback and parameters.

The two dimensions presented are built in a 3 × 3 table: the Tripartite Structure of Sustainability (TSS [4], see Figure 2).

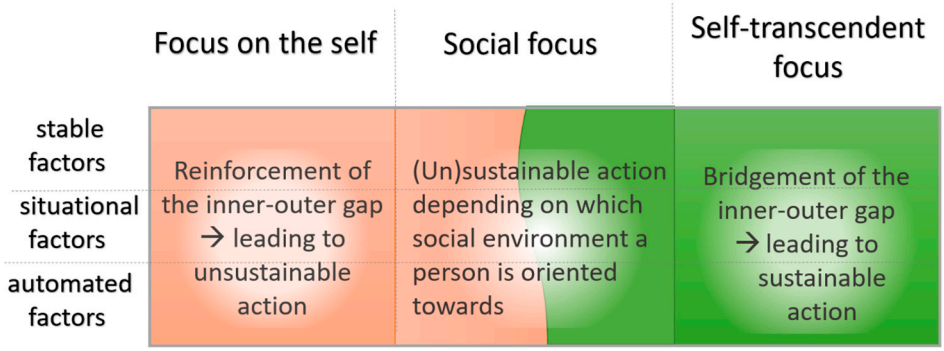

Figure 2. Tripartite Structure of Sustainability and presumed effects on sustainable action.

1. The reason to focus on the self in one's action is (implicitly) to maintain one's own security, power, or face (see Schwartz's values of self-enhancement [35]). The goal

formation towards sustainability", which emerged from a comprehensive literature review [19]. The model is "ontologically and epistemologically grounded in interdisciplinarity, multidirectionality, and interdependency, acknowledging the complexity of transformation processes" (p. 8). Drawing inspiration from their model, our research aims to better understand the connections between what they call the "internal" and the "external". Wamsler and colleagues see the boundary between internal and external as artificial,

is to optimize one's own opportunities. The underlying paradigm is mechanistic, rational, and competitive. There is hardly width in awareness; the focus is narrow and restricted to the person themselves.

2. In the social focus, the action of a person is informed by the (implicit) desire to belong to a group and to uphold this group's well-being. Awareness is as whole is needed to include close "others", usually from their direct social environment or, for example, their own party or nation. Individuals orient themselves towards the values they interpret as underlying this group's actions.
3. The term "self-transcendent" originates from the Schwartz value scale and includes values such as benevolence, humility, and universalism. The concept of a self-transcendent focus suggests that individuals see themselves as part of something larger than their own self or group. They possess a broad awareness that encompasses not only all humans across time but may also extend to the non-human world. Their actions are motivated by a desire to promote the well-being of this broader community. This perspective encourages a sense of connectedness and responsibility towards the welfare of others, transcending personal or immediate group interests.

Which focus/emphasis becomes active seems to be dependent on different factors that can be summarized in three activation points, which are the second dimension in the table. They are characterized as follows:

1. Stable: An action is performed primarily due to the values and attitudes of a person or group, which is the deep leverage point of intent according to Meadow's model [13]. The underpinning values, goals, and world views of actors shape the emergent direction to which a system is oriented towards.
2. Situational: An action is performed primarily due to an occurrence on the outside, that is usually manipulable, closely interwoven with the action and recognized as important. In Meadow's model, this situational activation is a shallow parameter similar to materials or feedback, defined as interactions between elements within a system that drive internal dynamics.
3. Automated: An action is performed primarily because of a programmed system inside a person, like psychological mechanisms, biases, emotions, habits, or scripts. The mechanism itself goes mostly unrecognized, but is similar for all humans. The mechanism itself is not changeable, whereas the trigger and outplay are inter- and intra-individually different. Situational activation and automatisms are closely interwoven because situations outside a person are "picked up" by mechanisms inside—like aroused emotions of a student because of very strict recycling regulations. Regarding the higher cost of a sustainable product, a person might react to the higher price with loss aversion. A higher cost is seen as a situational factor and loss aversion as an automatism in this case. In Meadow's model, automatisms can be seen as deep leverage points in the human system, such as a design or structure in the background that manages feedback and parameters.

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Wamsler and colleagues proposed the "Model of change for internal–external transformation towards sustainability", which emerged from a comprehensive literature review [19]. The model is "ontologically and epistemologically grounded in interdisciplinarity, multidirectionality, and interdependency, acknowledging the complexity of transformation processes" (p. 8). Drawing inspiration from their model, our research aims to better understand the connections between what they call the "internal" and the "external". Wamsler and colleagues see the boundary between internal and external as artificial, just applied for simplicity—as, for example, internal dimensions are often inter-subjective (e.g., socially defined) and qualities/capacities are often enacted (p. 6). In our model, this assumption is reflected in the fact that there are foci as well as activation points and that, in the addressed problem, situational activation and automatisms go hand in hand. In the discussion, this notion will be further reflected. By positioning this research within Wamsler and colleagues'

model, it is aimed to contribute to their endeavor to create a broader, overarching framework that allows for cross- and transdisciplinary co-creation. This paper also answers Woiwode and colleagues' call for research on the "empirical connections between people's inner dimensions and transformation, and the impact on actual behavior" [14] (p. 854).

2.3. Research Questions

After these classifications, the research questions are concretized. All of them focus on the contribution of the TSS to educating towards the new paradigm. The first question is if the model holds the potential to structure the findings of the field of sustainability research well:

- Is the TSS as a model able to fathom all empirical valid factors influencing the inner–outer gap that we find in the literature?

The second question asks if the TSS allows for predictions and thus allows for more targeted research, which would be the case if empirical evidence can be found for the direction of impact assumed in the model (focus on the self leads to unsustainable behavior, etc.):

- Is the TSS and the directional assumption it contains supported (by the direction of the factors' effects—sustainable or unsustainable)?

Both questions should at the end lead to a conclusion on what educators could do through education to support students in closing the inner–outer gap and act sustainably.

3. Methods

To approach these questions, a qualitative data analysis of factors that have been proven to influence whether a person acts sustainably was conducted. The factors were derived from articles identified through a systematic literature review. The direction of the factor's influence was captured, and the factors were then assigned to the TSS.

In regard to the factors, the goal was to collect a wide variety that was empirically shown to have an influence on the inner–outer gap (under this term, we subsume the gap between motions like judgments, attitudes, intentions, knowledge, and values on the "inner side" versus actual behavior and action on the "outer side", see [4]). The intention was to identify factors that either bridged the gap towards sustainable action or reinforced it with the outcome of unsustainable behavior. The systematic literature review broadly followed the PRISMA recommendations of 2020 to improve the validity and transparency and to avoid bias in the selection and analysis of the reviewed studies [36].

The first of three methodological steps was to retrieve potentially relevant publications. The following educational and psychological databases were each searched on 25 of October 2020: (a) the Education Resources Information Center (ERIC) and (b) the American Psychological Association's largest database, including PsycINFO, the Psychology and Behavioral Sciences Collection, and APA PsycArticles. In addition, because we expected to find relevant research related to global challenges in other fields, we used (c) all databases in the Web of Science Core Collection. Using Google Scholar and ResearchGate, it was checked whether any relevant research areas not covered by the selected databases were missed; this did not appear to be the case. The following most frequently used terms in the literature on the inner–outer gap were included: knowledge–action gap OR value–action gap OR intention–action gap OR attitude–action gap OR judgment–action gap. To keep the amount of data manageable, the timeframe was set to cover the last 15 years (2005 to 2020).

In 2020, the search parameters returned 116 potentially relevant articles from the databases. The inclusion criteria were papers that focused on sustainability, morality in relation to sustainability, or morality in general (as we see acting sustainably as a moral issue). Papers about morality in specific situations not related to sustainability were excluded, such as academic dishonesty, as were papers that had neither moral choices nor sustainability as the focus. Theoretical papers were deliberately not excluded because they turned out to point to several empirically relevant factors that the empirical papers did not cover (see inclusion criteria for the extracted factors). The inclusion and exclusion

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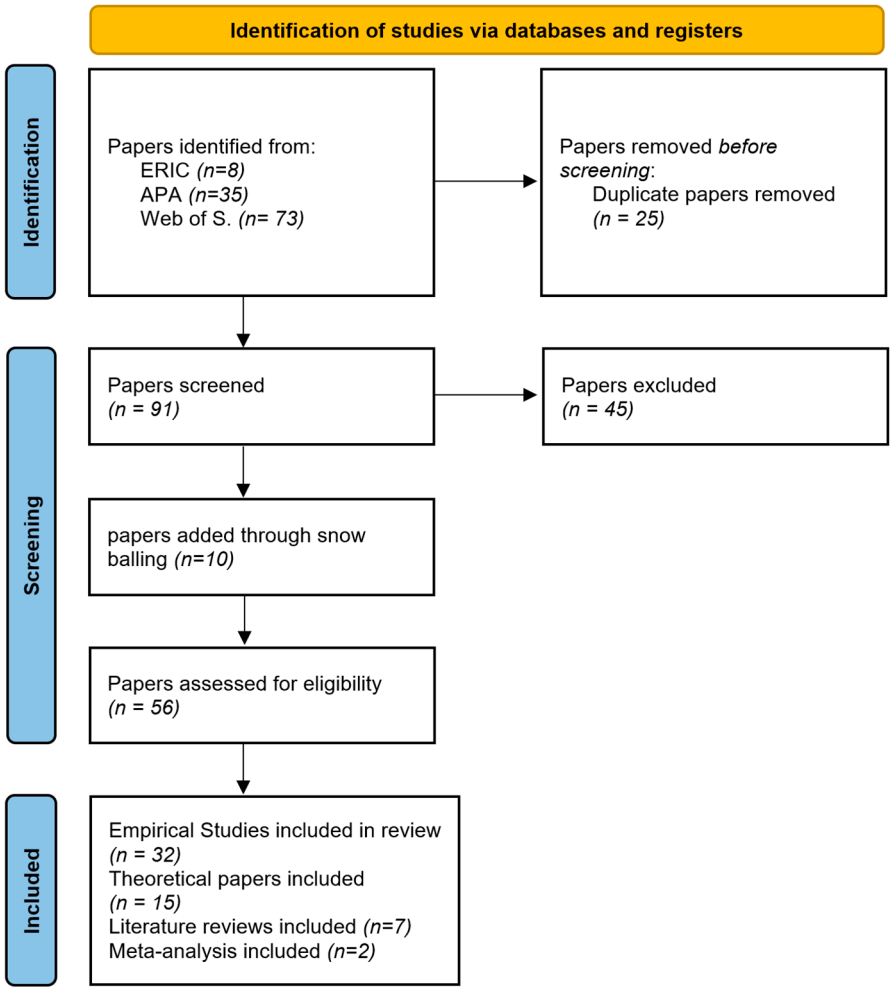

Figure 3. PRISMA 2020 flow diagram of identification of studies.

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Table S1 (overview of the reviewed literature, Supplementary Materials) provides an overview, in which the selected articles are described in more detail. The table shows the search terms through which the articles were found, the segments to which the articles were attributed, the topics and methods of the articles and the originating universities. In the case of the empirical articles and meta-analyses, the table also shows the target group and the empirical scope region of the analyses, as well as how the variable was operationalized and whether the measurement was problematized.

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The second methodological step was to develop the Inclusion criteria for relevant factors that had an influence on the inner–outer gap and to extract these factors. Therefore, at first, all factors were systematically collected. The quality of the findings and conclusions were diverse; some statements, for instance, amounted to theoretical hypotheses, some were carefully developed based on empirical data, and others had been tested and proven in one or multiple empirical designs. This necessitated the setting of a standard for considering a finding empirically valid. It was decided to not only collect the factors of studies conducted in the articles but also well-cited and summarized empirical evidence within the more

theoretical articles. However, due to available resources, not every indication of a factor could be followed in depth. Therefore, as a compromise, criteria for the inclusion of a factor to ensure empirical validity were developed. The factors that bridged or reinforced the inner–outer gap had to meet at least one of the following criteria:

- Empirical data were generated within the reviewed article itself in an empirical design that meets scientific standards.
- A factor that was not tested in the research itself was shown to be supported by at least three empirical studies. To find out whether the cited research was empirical, we read the titles and abstracts of the cited studies. We considered three articles to be sufficient to eliminate the risk of false-positive factors (because of, for example, problematic research designs or a misunderstanding of citations).
- The cited empirical source was a meta-analysis.

In this paper, "empirically valid" signifies factors meeting this standard. Additionally, only factors that showed the direct influence or mediated influence on sustainable or moral actions within the articles were collected. A mediated factor was, for example, in Klöckner's model [38], perceived behavioral control which influenced actions through the factor intention. Factors that only influenced, for example, moral judgment but that were not further tested with respect to their influence on (intention to perform) actions were excluded, as well as general factors like "intention" or "personal norm", which contains no specific content (intention to do what? which personal norm?). Concerning the question of how action was measured, self-reported data and even the measurement of concrete intention for a future act as valuable were considered. As not measuring real actions is problematic, we hereby followed Hertz and Krettenauer [39], who showed that self-reports as well as reported intentions indicate a higher probability that a real, live action will be taken, as if—of course—the prescribed effect is not the same, but lower. This decision made it impossible to indicate the extent to which a factor truly bridges or reinforces the gap in numbers. We therefore refrained from attempting to quantify the power of factors, and did so also for a second reason. The intentional inclusion of different strands of research on the inner–outer gap automatically raised the problem of incommensurability: the strands and the use of concepts in them are so different that they could not be compared in regard to their outcome. After the inclusion and exclusion criteria for the factors were settled, a second in-depth evaluation of the 56 articles was conducted, and all empirically valid factors that resonated with the criteria above were collected. This procedure resulted in a corpus of 83 empirically valid factors that showed an influence on the inner–outer gap. The factors were extracted and are captured in Table S2—together with their definition, their source, their impact on the inner–outer gap, and how they were retrieved (see Supplementary Materials).

In the third and last methodological step, the factors were coded towards the Tripartite Structure of Sustainability by three coders independently. They followed the guidelines of qualitative content analysis by Mayring [40], which are mainly deductive but also allows for inductive extraction. The coder manual followed the given descriptions of foci and activation points in the theory section. The coding of the activation points resulted in a Fleiss' Cappa of 0.69 and the coding of the different foci resulted in a Fleiss' Cappa of 0.60 between all three coders. According to Landis and Koch [41], both matches are substantial. Because Cohen's Cappa between Coder 1 und Coder 2 was 0.85, regarded as "almost perfect" [41], and Coder 1 had read all articles in depth and knew the background of each factor, we followed their codings for the article (shown in Table S2, Supplementary Materials, due to formatting reasons).

4. Results

Of the articles included in the literature review, 35% originated in Europe (mostly the U.K.), 26% in the U.S., 12% in Australia and New Zealand, 12% in Asia, 8% in Canada, and 3% each in South America and India; 39% of the articles were of a theoretical nature or consisted of literature reviews and 61% were empirical. We noted that 17 of the research

papers used self-reported data or collected intention instead of action, and only half of them (9 of 17) addressed the suboptimal character measurement of action. When it was mentioned, ethical concerns and methodological difficulties were named as rationales for this approach. The evaluation of all reviewed articles as described in the methods section can be found in Table S1 in the Supplementary Materials.

The review returned 83 factors influencing the inner–outer gap that were seen as empirically valid. As they were not of the same granularity, each of the smallest entities that was shown to have an impact and that met the criteria was depicted. Sometimes an article pointed out a factor that another article elaborated in more detail. In this case, both the umbrella term and the factors that went into more detail were registered (for example, the factor "self enhancement values", mentioned several times, was captured as an umbrella term, but also one article examined "power" as a singular factor). Each short description of the factors together with other information is gathered in Table S2: Factors (Supplementary Materials). All factors were categorized into the Tripartite Structure of Sustainability, as summarized in Table 1.

Table 1. Factors influencing the inner–outer gap sorted in the Tripartite Structure of Sustainability.

	Focus on the Self	Social Focus	Self-Transcendent Focus	No Specific Focus
stable	Preconventional stage, self-enhancement values (achievement, power, face, hedonism); selfishness; "Enviro-Sceptic" cluster; "Market Liberalist" cluster; extrinsic religiosity, amplifying subjective well-being through a green self-image (11)	Socially responsible families; love for children and grandchildren; social norms; pressure to keep up with resource-consuming trends; demonstrating morality to others; mistrust (6)	Post-conventional stage; self-transcendence values (benevolence, universalism, humility); new environmental paradigm; feeling of connection with nature; emotional bond between a child and nature; seeing forest "as life"; moral identity; "Committed Greens" cluster; "Ethical Conformist" cluster; intrinsic religiosity; "willingness to sacrifice for the environment"; unselfishness; moral attentiveness; self-conscious moral orientation (17)	"Ambivalent Bystander" cluster; "Internally Conflicted" cluster; "Material Greens" cluster (3)
situational	Consumed time; monetary costs; practicability; encouraging measurements (4)	Ethics-orientated social contexts; ethical leaders; unethical social contexts; unethical leaders; role models; ecological behavior in neighborhoods; information about positive social norms; trust felt towards the source of the information; high information quality; competence-based trust; integrity-based trust; enabling measurements; engaging measurements; exemplifying; intrinsic (social) rewards (15)	awareness of consequences; ascription of responsibility; immediate information given about individual consumption; information labels on products; reminders (like phone calls or posters); "discretionary time" (6)	perceived behavioral control (1)
automated	Fear; pressure because of suddenness or unexpectedness; status quo bias; loss aversion; satisficing; risk aversion; sunk-cost effects; desire for extrinsic rewards; temporal and spatial discounting (9)	Sympathy; empathy; tendency to conform to social norms; "Boomerang Effect"; Free-Riding Effect and Social Loafing (5)	Moral judgement disposition; moral sensitivity (2)	Bayesian reasoning; Occam's razor; inductive inference; availability bias (4)

A total of 76 of the 83 factors could be classified in regard to their focus (92%). All factors could be categorized as either stable, situational, or automated (100%). A total of 21 of the 24 factors related to a focus on the self showed a clear direct relationship with immoral/unsustainable behavior (88%)—only "encouraging measurements" had a clear

positive impact on sustainability (4%). "Desire for extrinsic rewards" and "status quo bias" were ambivalent (8%). Among the 26 factors with a social focus, 18 showed a positive influence on sustainable action (69%). Two factors were ambivalent (social norms and the tendency to conform to social norms, 8%), and six showed a clear negative impact (pressure to keep up with resource-consuming trends, mistrust, unethical social contexts, unethical leaders, Boomerang Effect, Free-Riding Effect and Social Loafing, 23%). The data showed that if the social surroundings showed or supported sustainable/ethical behavior, individuals acted sustainably/ethically. If the social environment expressed or supported the opposite, individuals acted in an unsustainable/unethical manner. All 25 factors that we saw as leading towards a self-transcendent focus in the reviewed papers had a direct or indirect positive influence on ethical/sustainable actions (100%).

There were eight factors that did not apply to the foci (see column "Not specifically assignable"): as stable factors, the clusters of "Ambivalent Bystander", "Internally Conflicted", and "Material Greens"; the situational factor "perceived behavioral control"; and the automatisms "Bayesian reasoning", "Occam's razor", "inductive inference", and "availability bias". The terms in Table 1 are further described in the Supplementary Materials, Table S2.

5. Discussion

In research, it is sometimes even more interesting to look at the misfits of an idea than to focus only on the fits. Therefore, in the discussion section, we mostly investigated the exceptions and relict factors, already having educational purposes in mind, which we will elaborate on after the conclusion. But before diving into the exceptions, we have to address the limitations of our research. The 83 extracted factors do not mirror the most up-to-date state of research or encompass the entirety of the research landscape due to the constraints of a confined time frame and restricted search parameters (the research was conducted in 2020 and we did not include "behavior/behaviour" instead of action or other inner parameters that might have been worth exploring). Additionally, not all factors were independently verified by the authors through primary sources. Although our inclusion criteria mandated a triple validation from distinct sources, the potential for false positives persists. Therefore, it is appropriate to view the content encapsulated within the Tripartite Structure of Sustainability (TSS, Table 1) as an introductory exposition. To achieve a more robust reliance and integration of this content, it is desirable to reproduce the research unburdened by these limitations. Our first investigation shows that this endeavor would necessitate many resources.

The first investigation is of the factors with a focus on the self that exceptionally lead to sustainable behavior. This is interesting, because it might show a way to guide people who are in the earliest stages of ego development to act sustainably. The only factor that had a clear positive direction is "encouraging measurements". With this term, Anable and colleagues refer to the use of information, education, incentives, penalties, and the law to encourage (motivate), and where necessary, enforce behavioral changes. There are overlaps with the two factors that were ambivalent: desire for extrinsic rewards and status quo bias. They are ambivalent because they usually lead to unsustainable behavior but were also used to trick participants into sustainable behavior in the reviewed articles. The status quo bias is the tendency to stick to default settings or avoid making decisions, especially when things become too complex. In the literature, this was used by preselecting a green energy provider in an online form which had the effect of participants choosing the green option more often [42,43]. The desire for extrinsic rewards was used to make people choose ecofriendly alternatives, for example, by providing financial incentives. However, Frederiks and colleagues reported that these rewards "are often surprisingly short-lived and/or inconsistent with behavior reverting back to baseline levels upon removal of the reward" [8] (p. 1388). The authors cited papers that showed that people even responded negatively to extrinsic rewards. This might be the reason why these measurements are considered to be shallow leverage points (see theory section). It seems that by using

encouraging measurements, the status quo bias and extrinsic rewards have an effect, but it would be too much to rely on them.

Further relicts were automatisms that had a positive influence upon sustainable action in research, but that did not apply to any of the foci.

- Bayesian reasoning: anticipating the likelihood of future events via an internal model constructed from past situations [44].
- Inductive inference: extracting meaningful mental representations from sparse data, which may be too sparse to derive a valid representation [44].
- Availability bias: the inclination to "draw on readily available information that is easily accessible in memory and springs to mind quickly, [. . .], especially personal anecdotes of family/friends, customer testimonials, and recent, frequent, vivid, salient, emotive or concrete examples" [8] (p.1388).
- Occam's razor: preference for simple over complex explanations [44].

All of these factors are automatisms, as well as the two ambivalent factors in "focus on self". Additionally, "automatisms" was the category where the most disagreement among the coders in terms of their focus happened. We see that automatisms tend to be rather undirected in their focus compared to stable and situational factors. This is also supported by the fact that they were most often used to manipulate the behavior of others. We think that in sustainability research and education, automatisms must therefore be treated with caution. Ignoring them does not seem to be an option; they appear to be very powerful and useful, as we have to assume that individuals deal with most conflicts—including those related to sustainability—in an automated way, mainly without recognizing it [31–33]. The notion that automatisms are important, but often unfocused, makes it necessary to revise the proposed TSS. We suggest including a bar at the bottom that collects undirected automatisms or provides a space to present the positions of the automatism (to which foci do they mostly lead?) more dynamically. If something similar were to be applied to the "situational factors", it could also solve the case with the relict factor "perceived behavioral control" which is "a measure that captures to which degree people have the opportunity and ability to perform a certain behavioural alternative" [45] (p. 1029). If individuals have the impression of behavioral control (the choice, for example, to be able to use an alternative to driving by car), it positively influences sustainable action [38]. We see having a choice as not automatically leading to one of the three foci. Researchers as well as educators would have to assume that the non-designated factors are impactful but probably only lead to a certain focus in connection with other factors (as is depicted in [38,46]). The proposed revised version of the model is shown in Figure 4.

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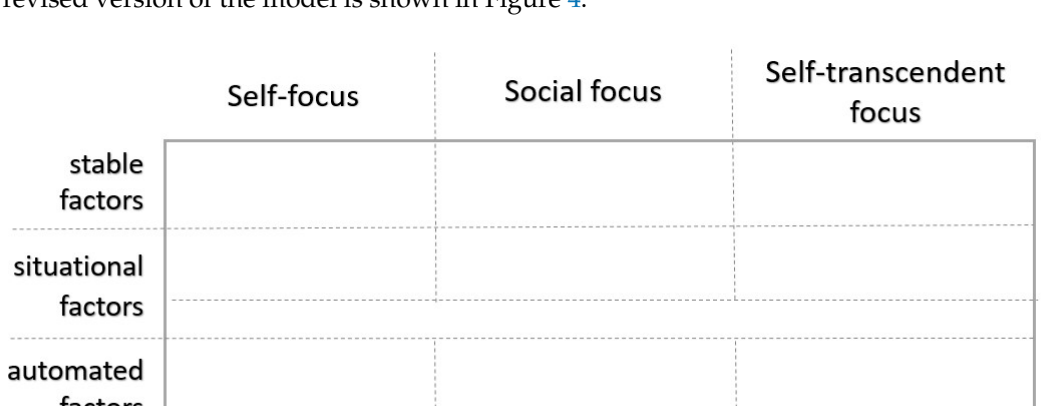

Figure 4. Tripartite Structure of Sustainability 2.0 © 2023 by Barbara Meyer is licensed under CC BY 4.0.

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4.0.

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Lee et al. [47] highlighted four clusters of people in their research on market decisions and Newton and Meyer highlighted three [48]. Each of the two clusters was clearly assignable to a focus, but the others could not be localized (see Table 2, highlighted in grey). All unclassified clusters entail descriptions of inner conflicts. For all three of them, the effect direction is the same: the inner–outer gap is sometimes, but rarely and inconsistently, bridged.

Table 2. Clusters and assignment to foci.

	Focus on Self	**?**		**Self-Transcendent Focus**
Lee et al. [47]	"Market liberalist": personal values, shop in various retail formats to maximize personal benefits, reject regulation	"Internally conflicted": No clear position, clash between personal and social values. Considerable shopping in hypermarkets despite moral obligations, inconvenient with regulations	"Ambivalent bystander": pursue personal and social values, discrepancy between stated values and actual behavior, agree with regulations	"Ethical conformist": social values as a consumer, use small local stores, welcome regulations
Newton and Meyer [48]	"Enviro-sceptics": see environment as not too important and are not willing to make sacrifices for it	"Material Greens": tend to view the environment as important, but act only pro-environmentally if it does not cost money or time		"Committed Greens": view the environment as important, purchase green-labeled products, decline plastic bags and volunteer time for green projects

It seems that while it is easy to allocate single factors, this becomes complicated when some of them are entangled as they are in the clusters. This is no problem if one sees the model as not intended to capture constructs that are composed of different factors. But it points to something deeper that is very relevant: the question of how the factors interact with each other. This interaction cannot be described in easy terms, but it seems like the fact that the interplay between (different) inner instances of a person and/or the outside is complex is increasingly being accepted. Jennings and colleagues, for example, see the understanding of the moral self as a "complex amalgam of moral constructs and processes" [49] (p. 105), and this perspective is emerging in moral psychology and self-psychology in general (p. 105). Considering this idea, it is not reasonable to assume that a decision regarding sustainable action is influenced only by one of the factors we reported above. More complex models picture how diverse factors interact with each other, e.g., [38,49]. Similarly, domain theorists [50,51] have collected evidence that one situation can activate reminiscence in the personal, the social, and the universal domains at the same time, and individuals struggle with weighing these against each other.

The relict clusters support the idea that the most interaction happens within a social focus. That seems logical: in most cases, an individual's social surroundings endow them with diverse views and contradictory opinions. People are unable to orient themselves towards all of these at once. Supportive of this idea are the findings of Babutsidze and Chai [52], who showed that ecological behavior in neighborhoods promotes "green behaviors" among individuals, but only visible green behavior and particularly only in densely populated regions. What triggers sustainable action are therefore only those factors close to a person who might be watching. In our view, integrity is only possible within an early self-focus (full focus on the self) or a late self-transcendent focus (full focus on the "oneness of everything"). In the light of conflicting factors, research on the inner–outer gap should consider different factors that are in conflict and explore when individuals prioritize which factor. The TSS is able to gather factors that play a role in this complexity in categories. The

separated categories help to investigate how elements interact with each other. Research, for example, allows for the assumption that situational and automated factors set stable elements such as attitudes and values in motion. This idea is depicted in ego development research, in the definition of a person's stage. Cook-Greuter defines it as the "level of ego maturity to which a person has consistent access to under ordinary circumstances without special support conditions or under unusual stress" [27] (p. 7f). The idea that situational and automated reactions gravitate around a stable inner stance was also often addressed in the reviewed literature, e.g., [38,46,49]. Jennings and colleagues, for example, found that unethical behavior of coworkers has a lower impact on individuals with a higher moral centrality [49] (p. 36), which we see as a stable self-transcendent focus. This might answer Horcea-Milcu and colleagues' call in 2022 [53] for knowledge on how transformation research can engage with values as leverage points. The findings in the TSS suggest that values connected with a self-transcendent focus lead to sustainable action if they are not disturbed and in the best case supported by special situational or automated parameters, as, for example, depicted in Table 1. Also, as we speculated above, automatisms seem to be strongly dependent on situational factors.

In summary, the factors shown to have an influence on the inner–outer gap that could not be applied helped to understand the interplay of the different factors. In our view, the data and discussion allow for the following hypotheses:

1. Individuals act sustainably if they have a stable self-transcendent focus and not too many situational or automated factors point towards a focus on the self/an unsustainable or unethical surrounding.
2. When individuals have a stable social focus, they act sustainably if the social surrounding they are orientated towards behaves ethically/sustainably and if not too many situational or automated factors point towards a focus on the self.
3. With a stable focus on the self, individuals may (inconsistently and for a short amount of time) act sustainably if the situational surroundings (like laws, rewards, etc.) are manipulated to steer their automatisms accordingly.

These are, of course, preliminary hypotheses which would need to be tested thoroughly.

6. Conclusions

This article had the aim of finding out how the Tripartite Structure of Sustainability contributes towards a new paradigm in (sustainability) education. All factors that were empirically shown to have an influence on the inner–outer gap could be classified as stable, situational, or automated in regard to their activation point. Eight factors could not clearly be allocated in regard to their focus (self, social, or self-transcendent), which we discussed. It can be concluded that the model is overall able to structure the findings of the field of the inner–outer gap in regard to sustainability. The limitations of the first version of the TSS are eliminated in the second version suggested in the discussion. The directional assumptions the TSS contains were overall supported by the direction of the effect of the assigned factors: 23 of 24 (96%) factors that emphasized the self had a reinforcing influence on the inner–outer gap (and 2 of them were ambivalent in their effect). Of 26 factors with a social focus, 18 showed a positive influence on sustainable action, 2 were ambivalent, and 6 showed a clear negative impact. Whether the factors bridged or reinforced the gap depended on whether the social environment was perceived as moral or sustainable. All 25 self-transcendent-focused factors had an indirect or direct positive correlation with ethical or sustainable behavior. The clear direction of the impact can be seen as empirical evidence for the assumption in the model: a focus on the self overall reinforces the inner–outer gap and leads to unsustainable behavior, a self-transcendent focus bridges the gap and leads to sustainable behavior, and in a social focus, individuals orient themselves towards their perceived social surroundings. We discussed the exceptions from this overall tendency and found relevant interactions between the different sections. Overall, the TSS seems to allow for predictions and therefore opens the way for more targeted research: it might help to construct research designs that have potentially more predictive power in

explaining sustainable actions than the current models. This is mainly because they would not consider a whole population "all the same", but use a segmentation approach [54] for each of the three foci as a group on its own, see [4]. In addition, they would make it possible to create research designs to explore the influence of groups of factors on others (for example, a value in relation to automatisms and the situation; see the hypothesis at the end of the discussion section). Another interesting influence in research comes from the fact that the TSS has a certain structure (a 3 × 3 table). This invites us to complete the "Gestalt" and one could ask "what could be another stable factor in this sector that we have not thought about yet"? All these possibilities would contribute to Woiwode and colleagues' call to find "empirical connections between people's inner dimensions and transformation and the impact on actual behavior" [14] (p. 854).

7. Consequences for Educators

After having answered the research questions, we want to use the last section of this paper to pick up the introductory thread and ask what educators can draw from our findings to help their students in closing the inner–outer gap/to act sustainably. A straightforward takeaway could be the following:

1. Avoid what attracts individuals into focusing only on themselves (stable, situational, or automated).
2. When creating educational surroundings, focus on establishing ethical and sustainable environments (situational factor). Also, support social automatisms and stable social factors that point towards sustainability.
3. Try to support the development of self-transcendent foci in individuals (stable, situational, or automated), but bear in mind that later paradigms cannot be understood in earlier stages of ego development: everyone would have to be met where they are in terms of their inner development.

We elaborate on these notions a little more in the following:

1. As can be seen in Table 1, we think that a part of what draws people into a *focus on the self* are the self-enhancement values of achievement, power, face, and hedonism and also the emotion fear. In our opinion, the European school system that was spread around the world as a result of colonization supports these values and this emotion in students [55]. To change this seems as important as letting students become aware of the automatisms that lead to a focus on the self. What poses a problem is the fact that automatisms usually go unrecognized (see the discussion on exceptions). They therefore elude both research and reflection. More research is needed on automatisms and what gives them direction toward a focus. Neuroimaging might be a way to perform research on automatisms, as some interesting findings show [56,57]. Also, creative ways must be found to work with them in education to make people aware of their automatisms. Only then, we believe, can individuals work on escaping the pull of automatisms that lead to self-focus and unsustainable behaviors such as fear, loss aversion, or the desire for extrinsic rewards. It might have an effect if educators make students sensitive to the un- or subconscious parts of their decision-making process and help them to become aware of automatisms like habits and scripts and their influence on themselves and the world. For the educational handling of automatisms, neuroeducational findings and techniques also offer promising avenues. Although a gap or transfer deficit in translating neuroscientific insights into educational practice still exists, transdisciplinary collaborations between neuroscience and educational research and practitioners appear promising [58–60]. Neuroeducational insights highlight, for example, the importance of promoting executive functions (e.g., working memory, inhibition, cognitive flexibility) to decelerate, make conscious, and regulate automated decision-making processes: Executive functions (EFs) "enable the individual to evaluate or judge their position in relation to others, to the group and the social system and to act according to this evaluation. Therefore, the EFs are not only relevant for cognitive performance but also for self-regulation and behavior,

and for social and emotional functioning. They are indispensable for personal growth over the period of childhood and adolescence" [58], p. 10.

2. As all educational institutions are at the same time social surroundings of the students who work and live in it, educational stakeholders have a lot of influence if they create a sustainable *social environment* in their institutions. We consider ethic-orientated contexts and leaders, positive role models, information about positive social norms, trustable information and informants, the provision of examples, and everything else that was found in Table 1 as helpful instruments. At the same time, educators should avoid what was found to hinder sustainable behavior having a social focus like the Boomerang or the Free-Riding Effect.
3. When trying to help individuals towards a stable self-transcendent focus/the new paradigm, it has to be kept in mind that this is a later stage of the developmental process (see "theory" section). In our opinion, reaching the goal of the new paradigm in sustainability (see instruction) would necessitate prioritizing vertical development against the (also needed) acquisition of competencies in education. Ego development research does not see competencies as contributing to the transition into a new paradigm [27]. There are some notions that are important when focusing on vertical development: Chandler and colleagues showed that educational programs are only useful if they are designed for the next stage a person will reach or the stage after [61]. Designs for earlier, actual or later stages do not help in development. So, firstly, supporting vertical development would necessitate knowing the center of gravity a person has. Their stage could be measured with the robust Washington Sentence Stem Test [24]. Leverage points into the next center of gravity seem to be consciously and systematically dealing with the thinking, doing and being of the next stage [61], which would have to be considered in the design. Two additional assumptions of ego development theory play a role and would need to be reflected upon [27] (p. 2f):

- "While vertical development can be invited and the environment optimally structured towards growth, it cannot be forced. People have the right to be who they are at any station in life".
- "Development occurs through the interplay between person and environment, not just by one or the other. It is a potential and can be encouraged and facilitated by appropriate support and challenge, but it cannot be guaranteed".

Therefore, the accompaniment in vertical development should always be seen as an offer. This is especially the case because individuals experience stage transformations, especially between the three main shifts outlined in the TSS as foci, as very challenging and even frightening [27]. As the whole way of seeing and being in the world changes, this transition needs to be well accompanied. All in all, it seems that we could learn a lot from how indigenous communities transfer knowledge and culture to the next generation. Their way of educating is far more relational and also has many other characteristics that are described in the new paradigm (see [55]). With these notions in mind, additional research is needed to create offerings and to measure their success.

We hope that our research, including the suggested model, inspires education as well as research on sustainability. We honor and thank all the scientists whose work we cited and all those who performed research on sustainability and the inner–outer gap in the last few centuries. We are aware that this research and the proposed TSS are standing on the shoulders of giants. In awareness of the limitations and because of our interest in discussing the results, we invite educators and researchers to debate this paper and its findings, for example, on the Research Gate and Academia platforms. We also invite researchers and practitioners to use and further develop this preliminary model.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/su16093622/s1, Table S1: overview reviewed literature; Table S2: factors influencing the inner-outer gap. Table S3: PRISMA Checklist.

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