Mindfulness and sustainability: correlation or causation?

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Mindfulness-based approaches have been suggested as a potential remedy for an increasingly unsustainable consumption level in early industrialized countries. This article reviews twelve current empiric papers (2005-2013) on five different potential pathways in which mindfulness is thought to unfold its effects on sustainable behaviors. Unfortunately, robust empiric evidence on the instrumentality of mindfulness-based interventions to promote sustainable lifestyles is still rare. Most of the available data originates from cross-sectional studies evidencing a small, positive relationship between some facets of dispositional mindfulness and diverse consumption behaviors. Null-effects of one prospective study blunt claims on the effectiveness of mindfulness practice to directly change consumption patterns though. Nevertheless, indirect effects including promotion of subjective well-being and decline of materialistic values are encouraging enough to justify future research on the topic. Specific recommendations for such future research are given.

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Potential pathways from mindfulness to sustainable consumption

Various recent conceptual papers have proposed an instrumental role of mindfulness for attaining sustainability-related goals [1,2,3]. A systematic literature review [4] extracted four potential pathways through which mindfulness could help to establish more sustainable consumption behaviors. These are comprehensively understood here as all acts to satisfy needs in different areas of life (housing, nutrition, mobility, etc.), comprising the complete consumption cycle (acquisition, usage and disposal) of goods and services, while considering impacts on the environment as well as on all people involved in the provision of these goods and services [5]. Based on new findings [6,7] we would like to present an updated picture, discussing (at least) five different areas of potential effects on sustainable behaviors (see Figure 1):

1) Disruption of routines: mindfulness implies an awareness that can interrupt automated thought processing, the mode in which people predominantly operate [8,9], also being referred to as ‘being on autopilot’. This characteristic of mindfulness should enable people to become aware of unconscious, potentially unsustainable consumption routines as a first step to break them eventually [10].

2) Congruence of attitude and behavior: in the field of health behaviors, two cross-sectional, correlational studies presented evidence that a—disputed—measure of dispositional mindfulness was associated with self-reported ability to translate intentions into actual
Meta-analytic evidence for the relationship between mindfulness and sustainable consumption behavior

We found 12 studies published in 9 articles since 2005 that used sufficiently similar operationalizations of both variables to be included in this meta-analysis (see Figure 2). All but one study are cross-sectional and correlational, thus merely suggestive of potential causal relations. The first above-mentioned pathway, disruption of routines, holds the potential to directly inhibit unsustainable consumption behaviors, such as impulsive or compensatory purchase behaviors. The remaining pathways suggest some form of indirect effects, either moderated or mediated by a variety of variables:

1) Regarding the first pathway, a negative correlation between a mindfulness index and self-reported impulsive buying tendencies was evidenced [24].
2) The reduction of the attitude-behavior gap framework has been—unsuccesfully—applied to nutrition and clothing consumption behavior [25**].
3) Connectedness to nature [26] and social dominance orientation [27] have been investigated in terms of different pro-social mediating aspects of the mindfulness-sustainability behavior relation.
4) In the area of values and meaning in life, construction of meaning [6], the relative importance of intrinsic values (e.g. personal growth and relationships) versus extrinsic values (e.g. financial success and popularity) [17] and material values [25**] have been investigated as mediators between dispositional mindfulness and self-reports on sustainable consumption behaviors.
5) Regarding health aspects, subjective well-being was addressed alongside materialism in two studies [17,25**] whereas another study [28] focused exclusively on well-being as a mediator. Health behaviors were also shown to mediate the positive association between mindfulness and pro-environmental behavior [7].

We submitted the zero-order bivariate relationships between the mindfulness measures and sustainable behavior measures of all 12 studies (N = 3913) to a meta-analysis, converting

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Footnote:

For extended inclusion criteria, see Fischer et al. [4**]. Studies in their SLR were included if they alluded to a mindfulness concept that comprised an element of awareness and/or a certain quality of this awareness (i.e. equanimity, benevolence, openness). Regarding sustainable consumption behaviours studies referring to either pro-environmental or socially responsible consumption behaviours were allowed. Variables as beliefs or attitudes (e.g. Panno, et al. study 2, second outcome) were not included. In this meta-analysis papers that appeared after 2015 were included using the same reasoning.
available effect size measures to equivalents of $r$. The weighted overall-mean effect size amounted to $r = .199$ (see Figure 2), pointing to a small, positive cross-sectional relationship between different measures of trait mindfulness and sustainable consumption behaviors (except for the second study two of Panno et al. [27], who used an approach with long-time practitioners). The different measures of ‘mindfulness’ are especially problematic, as they do not reflect a unitary concept, often distort traditional meanings of the term and have serious validity issues (see Grossman this volume). For example, two studies [17,27] use an instrument that only captures one putative facet of mindfulness (perceived inability to pay attention to daily activities), when mindfulness seems to be multifaceted. Moreover, this facet was only marginally related [6,26] or completely unrelated [7,25**] in subsequent studies, that all pointed toward a much greater importance of the awareness facet, reflecting sensitive observations of outer experiences. These studies also agree on a 0-link between the mindfulness facet of accepting whatever arises in a given moment and sustainable behaviors, suggesting that not all mindfulness facets are equally contributory to achieving sustainability related goals (see Table 1).

A major shortcoming of almost all mentioned studies is their cross-sectional, correlational nature, which prevents concluding anything about a true instrumental, that is causal, role of mindfulness (practice) for bringing about changes in sustainable consumption behaviors. It is possible that cross-sectional correlations are simply expressions of a non-causal association between questionnaire indices of mindfulness, and similarly measured indices of sustainability variables. This could mean that respondents endorse a certain lifestyle in which mindfulness and a propensity to consume less or more sustainably come together, or that some unknown third factor causes the relationship. Only prospective studies—in which targeted changes in mindfulness are shown to influence attitudes or behavior related to sustainability—can provide evidence of the utility of mindfulness in this regard.

**Experimental evidence on the effectiveness of mindfulness-based interventions**

In order to distinguish possible causal relations from mere correlations between variables, we performed a randomized controlled intervention study: 131 healthy adult volunteers participated in an 8-week mindfulness-based intervention aimed at improving wellbeing while sensitizing for consumption-related sustainability issues. The intervention was based on a classic MBSR format, but expanded by relevant topics such as for example personal needs, (dis) satisfaction and appreciation of material goods. In few occasions, exercises used in educational programs for sustainable consumption were introduced in an adapted form, as for example a mindful shopping exercise and a meditational journey of a jeans [29]. Although pre-intervention correlations between indices of mindfulness and sustainability in our study were very similar to earlier cross-sectional findings (see Figure 2) and the scale used to index mindfulness (Comprehensive Inventory of Mindfulness Experiences; [30]) did show large increases as a consequence of the mindfulness program, questionnaire results indicated no direct effects upon either nutrition-related or clothing-related consumption behaviors or attitudes [25**]. These findings contest claims on a direct, causal role of mindfulness in promoting sustainability related outcomes. Nevertheless, we did find intervention-related changes in

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**Figure 2**

<table>
<thead>
<tr>
<th>Study</th>
<th>Area</th>
<th>n</th>
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<tr>
<td>Amel (2009)</td>
<td>-</td>
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</tr>
<tr>
<td>Park &amp; Dhandra (2017)</td>
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</tr>
<tr>
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<tr>
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</tr>
<tr>
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</tr>
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<tr>
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<td>310</td>
<td>.203</td>
</tr>
<tr>
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</tr>
<tr>
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<tr>
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**Summary**

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*Meta-analytic evidence on the bivariate relationship between mindfulness and sustainable consumption behaviors.*

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two factors that are indirectly related to sustainable behaviors: overall increased sense of wellbeing and small reductions in the importance participants attributed to materialistic values. Thus, mindfulness practice may, over the long term, reduce resource consumption by affecting the extent to which materialistic concerns are perceived to be important, which in turn are related to a variety of sustainability relevant attitudes and behaviors, such as environmental conservation or conspicuous consumption [18]. Furthermore, changes in these domains may take more time to occur than the 8-week time-frame of the reported study. Indeed, some tentative follow-up findings of our investigation do suggest slight increases in sustainable behaviors over time. Overall, it may be too early to dismiss the possibility that mindfulness training may have beneficial effects upon sustainability-related behaviors or attitudes. Given the sparse amount of prospective research on the effectiveness of mindfulness-based interventions, we believe that further investigations are required in the following areas:

- Evaluate different kinds of mindfulness-based programs. Ours was only a first attempt and other approaches might be more successful, as for example, combining mindfulness-based approaches with nature experiences [32].
- Employ longer intervention time-frames (at least 3 months) and evaluation time-frames (at least 6 months), with continuing meditation practice support.
- Focus on behaviors that have shown to relate to materialism (e.g. conspicuous consumption behavior) and subjective well-being (e.g. nutrition).

- Focus on participants with a strong intention to live more sustainably.

### Conclusions

The correlational evidence we reviewed points toward a pattern of lifestyles that reflect an inclination to both mindfulness practice and sustainability-related behaviors, alongside numerous other manifestations, for example heightened compassion and connectedness to nature, weaker social dominance orientation and materialism, greater health-related behavior and sense of wellbeing. Supporting evidence concerning direct causal effects of mindfulness, or mindfulness interventions, upon sustainable consumption behaviors is lacking, and the correlational data, as well, are modest in magnitude. Nevertheless, indirect effects on materialism and well-being reported in the literature are encouraging enough to justify ongoing research efforts on the possibility of mindfulness programs contributing to sustainability-related aims. Mindfulness programs might best be seen as complements to more direct approaches, such as policy-based choice architecture or targeted psychoeducational methods. Given the changes in benevolent attitudes toward self, others and nature, that mindfulness interventions appear to influence, mindfulness programs may conceivably exert synergistic effects to concerted social, political and psychoeducational efforts in this regard. Future research will tell.

### Conflict of interest statement

Nothing declared.

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**Table 1**

<table>
<thead>
<tr>
<th>Study</th>
<th>SCB measure</th>
<th>MF measure</th>
<th>1. ACC</th>
<th>2. AWA</th>
<th>3. OBS</th>
<th>4. DEC</th>
<th>5. DES</th>
<th>6. OPN</th>
<th>7. INS</th>
<th>8. REL</th>
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<td>Amel [31]*</td>
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<td>FFMQ</td>
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<td>.28**</td>
<td>.28**</td>
<td>.11**</td>
<td>.11**</td>
<td>.11**</td>
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<tr>
<td>Barbaro and Picket [26] 2</td>
<td>PEB</td>
<td>CAMS-R</td>
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<td>.15</td>
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<td>.07</td>
<td>.00</td>
<td>.25**</td>
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<td>.31**</td>
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</table>

*Note: Mindfulness facets are: Acceptance/non-judgement (ACC), Acting with Awareness (AWA), Observing/Awareness (OBS), Decentering/Non-reactivity (DEC), Describing (DES), Openness (OPN), Insight (INS), Relativity (REL). I = Inner, O = Outer. Sustainable consumption behaviors measures are: Environmentally responsible behavior (ERB), Ecological footprint questionnaire (FFMQ), General Ecological Behavior (GEB), Mindfulness measures are: Mindful attention and awareness scale (MAAS), Five factor mindfulness questionnaire (FFMQ), Cognitive and Affective Mindfulness Scale- Revised (CAMS-R), Kentucky inventory of mindfulness skills (KIMS), Comprehensive inventory of mindful experiences (CHIME). Only studies, where results on mindfulness facets were reported and could unequivocally be allocated, are presented here.

* These coefficients are Beta-weights, as no zero-order correlations were reported.
- ** p < 0.05.
- *** p < 0.01.
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References and recommended reading
Papers of particular interest, published within the period of review, have been highlighted as:

- of special interest
- of outstanding interest


This conceptual paper provides a comprehensive overview on different potential pathways in which cultivating mindfulness might contribute to lowering material consumption. It concentrates on the interplay between intrinsic values, well-being and sustainable behaviors all potentially promoted by mindfulness practice. Potential pitfalls and chances for societal change through intensified mindfulness practice are discussed.


This conceptual paper discusses a plethora of potential positive outcomes of mindful consumption on the personal, societal and environmental level. For each level transformative outcomes and potential future research questions are presented and discussed.


This review analyses empirical papers on the nexus between mindfulness and sustainable consumption behaviors from the last 20 years. Besides identifying four potential pathways in which mindfulness is thought to promote sustainable lifestyles, they reveal methodological shortcomings of hitherto existing research and give recommendation for future research.


25. Geiger SM, Fischer D, Schrader U, Grossman P: Meditating for the planet? Effects of a mindfulness-based intervention study on sustainable consumption behaviors. Environ Behav submitted for publication. This study is the first one to employ an experimental approach to investigate if mindfulness practice is truly causally instrumental to promote sustainable behavior change. The modest results blunt claims of the hitherto mainly cross-sectional studies. Effects on well-being and materialism are discussed as indirect pathways to sustainable behavior change.


