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Who is Morally Responsible for Microfiber Pollution?

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Introduction
Microplastic fiber pollution (MFP) is the persistence of microfibers (fibrous plastic particles <5mm in diameter and length) in the environment in levels sufficient to harm aquatic/marine ecosystems, primarily caused by the laundering of polyester garments. Who should be held most accountable for this harm?

Definitions
• Moral Responsibility: An agent’s accountability for an act which they voluntarily committed/contributed to.
• Voluntary Action: Those that proceed from an agent’s internal elements and are in the agent’s power to do or not
• Causal Responsibility: The relationship between an agent and an outcome of the agent’s act.
• Moral Responsibility Principle: An agent’s moral responsibility for an outcome is proportional to their causal responsibility for that outcome.

Acronyms
MFP: Microplastic Fiber Pollution
OAMs: Outdoor Apparel Manufacturers
GCIL: Global Collective of Individual Launderers

Table: Individual Launderer vs. Outdoor Apparel Manufacturer

<table>
<thead>
<tr>
<th>Individual Launderer</th>
<th>Outdoor Apparel Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contributes to tail-end of MFP process by buying polyester garments and adopting certain laundering habits.</td>
<td>Contributes to front-end of MFP process by designing the polyester garments available on the market. (E.g. Patagonia, Polartec)</td>
</tr>
<tr>
<td>Capable of having moral responsibility, because he contains internal elements (e.g., goals, desires) that motivate voluntary actions.</td>
<td>Capable of having moral responsibility, because its Corporate Internal Decision Structure (CIDS) synthesizes employees’ acts into collective intentions, which give rise to voluntary collective actions.</td>
</tr>
</tbody>
</table>

Initial Argument
• Causal Responsibility Principle: An agent’s causal responsibility for an outcome depends on how directly his act contributes to the outcome.
• The individual launderer is most causally (and thus morally) responsible, because he contributes most directly to MFP:
  1. He is the central agent necessary to make laundering happen by physically carrying out laundering. Otherwise, microfibers would be stuck at other stages of MFP (e.g. in factories, in apparel stores) and never enter waterways.
  2. Even one launderer laundering one garment is sufficient to cause environmental harm. Even if all manufacturers stopped producing polyester garments/washing machines, any launderer who owns even one polyester garment could wash it by hand, shedding microfibers into wastewater streams.

Objection
• Amended Causal Responsibility Principle: An agent’s causal responsibility for an outcome depends on both how directly his act contributes to the outcome, and how much his behavioral change would alter the outcome.
• Although OAMs contribute less directly to MFP than individual launderers do, OAMs hold more causal (and thus moral) responsibility because changes in OAMs’ behavior hold much greater potential to reduce MFP:
  • OAMs control materials used in production. By designing better fabric constructions and implementing industry benchmarks for fiber release, OAMs could vastly reduce MFP.

Global Collective of Individual Launderers
Capable of having moral responsibility. Despite lacking cognitive mechanisms (like a “hive mind”) or organizational structures (like a CIDS) to form collective intentions, the GCIL contains internal elements – an amalgamation of disparate, uncoordinated intentions and a collective nature (a teleological drive to have clean clothes) – that give rise to voluntary collective actions.

Rebuttal
Although the individual launderer’s causal responsibility is insignificant, he belongs to a global collective of individual launderers (GCIL) who, through the sum of their laundering practices, contributes most directly to and holds the greatest potential to reduce MFP: 1. It’s relatively easy for a launderer to reduce his microfiber output; circumstances present more than one moral option: • Natural fiber cloths, whose fibers wouldn’t attract oily chemicals, are available. • Rozalia Project’s microfiber catcher keeps 2,000-9,000 microfibers from public waterways per wash per household. • Laundering frequency, wash duration and spin speeds are factors he can easily change.
2. In contrast, OAMs must take costly steps and potentially sacrifice basic business goals to mitigate MFP: 3. Since the GCIL influences other stakeholders, it represents the crucial step in the microfiber’s lifetime where agent intervention can most effectively prevent/reduce MFP. 4. The GCIL’s whole exceeds the sum of its parts, because individuals can perform contagious acts influencing each other. Hence, the global collective of individual launderers (GCIL) is most causally (and thus morally) responsible for MFP.

Figure 1: Estimation of Causal Responsibility of Agents Involved in MFP

<table>
<thead>
<tr>
<th>Directness to which agent’s act contribute to outcome</th>
<th>Individual Launderer</th>
<th>Outdoor Apparel Manufacturer</th>
<th>Global Collective of Individual Launderers</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Low</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Degree to which change in agent’s behavior would alter outcome</td>
<td>Low</td>
<td>High</td>
<td></td>
</tr>
</tbody>
</table>

Acknowledgements
I’d like to thank professor Jason Gardner for teaching the Introduction to Environmental Ethics class that inspired this paper, and for offering suggestions for improvement.