**Druckman & Jackson (2010) – the bare necessities: how much household carbon do we really need?**

* The underlying premise in this paper is that the consumption patterns that characterize Western societies are unsustainable in terms of the resources they require and the emissions they generate
  + In the face of the need to make ‘deep’ cuts in carbon emissions, consumption restraint may be a perfectly legitimate response if we are to achieve goals such as those projected by the IPCC
  + Yet there is little attempt to restrain either material throughput or income growth
* Policy-makers are now struggling to find ways to shift society to lower carbon modes of living
  + Some believe that technological change will deliver a lower carbon future – undoubtedly technology will be part of the solution, but it’s also clear that this will not be sufficient on its own (HM Government, 2005)
  + Behaviours and lifestyles will also need to change (Defra, 2008; Jackson, 2008; Jackson & Papathanasopoulou, 2008; Reay, 2006)
* A key requirement for the success of any such strategy is to ensure that people are still able to live a ‘decent’ life
  + Includes being able to provide food and shelter for themselves & families
  + And to participate effectively in the life of society
* This paper explores the potential for a Reduced Consumption Scenario in the UK that could deliver this goal
  + Determine the minimum income standard needed to achieve this goal, where minimum acceptable standard of living was defined as “more than just food, clothes, and shelter. It is about having what you need in order to have the opportunities and choices necessary to participate in society” (Bradshaw et al., 2008)
  + Consistent with growing body of research that emphasizes the importance of social relations in peoples’ ability to flourish ()
    - Once material needs are met, peoples’ ability to flourish is correlated to their “ability to give and receive love, to enjoy the response of their peers, to contribute to useful work, and to have a sense of belonging and trust in the community” (note: difference between what we perceive is necessary to achieve these goals and actual?)
  + The definition does seek to exclude items that may be regarded as “aspirational” – it’s about fulfilling needs and not wants
* Results: emissions in the Reduced Consumption Scenario are 37% lower than the actual consumption-based emissions in the UK
* The last 50 years have seen an unprecedented rise in consumerism
  + Increase in discretionary income/spending
  + Despite this material success, the percentage of UK citizens reporting themselves ‘very happy’ declined from 52% in 1957 to 36% before the recent recession, and rates of stress and depression are increasing (Naish, 2008; Wilkinson & Pickett, 2009)
    - It is increasingly clear that a materialistic notion of the ‘good life’ does not make us happy (Easterlin, 1995; IPCC, 2007; Layard, 2005; Marks et al., 2006; Perri & Christie, 1998)

**Moran et al. (2020) – quantifying the potential for consumer-oriented policy to reduce European and foreign carbon emissions**

* While not discounting the importance of targeting GHG reductions at the point of emissions, it is important to remember that all production is ultimately linked to households via long supply chains and it is thus possible to pull production toward lower-carbon alternatives by tugging at any point along these chains
  + Change in consumer behavior can influence global production recipes, drive demand toward lower-carbon products, and alter the level and composition of global consumption (O’Rourke, 2015; Stavros et al., 2016)

**Increasing recommendations by researchers to investigate demand-side / consumption-based solutions:**

* **Creutzig et al. (2018):** Research on climate change mitigation tends to focus on supply-side technology solutions. A better understanding of demand-side solutions is missing. We propose a transdisciplinary approach to identify demand-side climate solutions, investigate their mitigation potential, detail policy measures and assess their implications for well-being
  + This gap is unfortunate, as demand-side solutions entail fewer environmental risks than many supply-side technology (von Stechow, 2016)
  + Demand-side solutions for mitigating climate change include strategies targeting technology choices, consumption, behavior, lifestyles, coupled production-consumption infrastructures and systems, service provision and associated socio-technical transitions
* **Girod, van Vuuren, & Hertwich (2014):** While national climate policy can address countries’ production or consumption, climate mitigation via changes in consumption has previously received relatively little attention in climate policy literature
  + Consumption oriented climate policy allows for low cost mitigation
  + This article reviews the carbon footprint of products in the five main consumption categories (food, shelter, travel, good, and services) and compares their compatibility with the greenhouse gas intensity required in 2050 to meet 2C climate target
  + We conclude that there is substantial climate mitigation potential from changing consumption choices which can be tapped through climate policy by addressing non-cost barriers
* **Dubois et al. (2019):** Through their consumption, households are responsible for 72% of global greenhouse gas emissions (Hertwich & Peters, 2009)
  + Household behavior therefore is an essential component in climate policies. Especially in high income countries such as those in Europe, Australia and North America
  + We need to know how willing households are to change, and to what extent proactive behavioral changes will be mobilized by climate policy-making
    - Very steep reductions in emissions are needed if the global community is to meet the goals of the Paris Agreement, which translate into a reduction of emieeions from 50 gigatons of CO2 in 2020 to 5 gigatons in 2050, and eventually net zero by 210
    - Climate change mitigation will increasingly affect households and their lifestyles. Yet…existing mitigation policies…[do not] keep emissions on track with an emission pathway compatible with the 1.5C goal
  + Driving changes in attitudes, norms or practices could shape consumption habits – and thus create motives for further voluntary changes to then emerge (Jackson, 2005)

**Hertwich & Peters (2009):**

* On the global level, 72% of GHG emissions are related to household consumption, 10% to government consumption, and 18% to investments
  + Nutrition is the most important consumption category, with food accounting for nearly 20% of the GHG emissions
  + Shelter, or the operation and maintenance of residence, causes 19% of the emissions
    - Food and services are more important in developing countries, while mobility and manufactured goods rise fast with income and dominate in rich countries

**O’Rourke (2014) – the science of sustainable supply chains**

* Recent advances in the science and technology of global supply chain management offer near-real-time demand-response systems for decision-makers across production networks
  + Technology is helping propel “fast fashion” and “lean manufacturing,” so that companies are better able to deliver products consumers want most
  + Yet companies know much less about the environmental and social impacts of their production networks
* A buyer for a global apparel company can see sales data in each of their retail outlets, track and communicate with consumers, monitor orders being sent to factories, and assess the location of shipments in their global distribution system ()
  + Yet it is still almost impossible to trace the cotton in a popular shirt form the store back to the farms where it was grown…let along to measure the full impacts and externalized costs of the apparel supply chain
    - Analysts have estimated that there are $4.7 trillion in environmental costs externalized each year from global production systems (), 6.4 billion tons of CO2 emitted, more than 20% of global emissions, through production of traded goods (), and 567 km^3 per year of water associated with global food trade alone (). Also, current levels of global production and consumption are using 50% more natural resources and services than ecosystems regenerate ()
* Global brands and retailers deploy complex and fluid supply-and-demand networks, connecting global systems of marketing, branding, and distribution to regional nodes supplying raw materials, components, and finished products
  + These networks often span the globe, extend five or six tiers deep, and can reconfigure overnight in response to changes in consumer demands, commodity prices, currency fluctuations, political risks, and so on ()
* In areas where it directly benefits corporations, we have seen progress in measuring and accounting for energy, water, waste, and packaging
  + However, sustainability initiatives without direct cost savings have not advanced as far or as fat()
* The market is moving toward “demand-driven supply chains,” so it is critical to connect consumers not only to product design and retailing but also to the full impacts of their choices ()

**Hoekstra (2014) – Humanity’s Unsustainable Environmental Footprint**

* Improved technologies (eco-efficiency) alone will not be sufficient to reach this goal; consumption patterns will need to alter as well ( )
* Exploring how we can better institutionalize full supply-chain responsibility is one of humanity’s major research challenges toward achieving a sustainable future

**Wiedmann (2020) – Scientists’ Warning on Affluence**

* Worldwide growth in affluence has continuously increased resource use and pollutant emissions far more rapidly than these have been reduced through better technology
* Any transition towards sustainability can only be effective if far-reaching lifestyle changes complement technological advancements
  + However, existing societies, economies and culture incite consumption expansion and the structural imperative for growth in competitive market economies inhibits necessary societal change
* Ripple et al. fall short of clearly identifying the underlying forces of overconsumption and of spelling out the measures that are needed to tackle the overwhelming power of consumption and the economic growth paradigm
  + We provide evidence from the literature that consumption of affluent households worldwide is by far the strongest determinant and the strongest accelerator of increases of global environmental and social impacts
* Allocating environmental impacts to consumers is consistent with the perspective that consumers
  + are the ultimate drivers of production, with their purchasing decisions setting in motion a series of trade transactions and production activities, rippling along complex international supply-chain networks
  + however, allocating impacts to consumers does not necessarily imply a systemic causal understanding of which actor should be held most responsible for these impacts
    - scholars of sustainable consumption have shown that consumers often have little control over environmentally damaging decisions along supply chains,
      * however, they often do have control over making a consumption decision in the first place
* The majority of studies agree that by far the major drivers of global impacts are technological and per-capita consumption
  + Consumption (and to a lesser extent population) growth have mostly outrun any beneficial effects of changes in technology over the past few decades
  + Furthermore, low-income groups are rapidly occupying middle- and high income brackets around the world, which can further exacerbate the impacts of mobility-related consumption, which has been shown to disproportionately increase with income
* It is highly unlikely that we can reduce GHG emissions while still growing our economies…
  + Renewable energy, electrification, carbon-capturing technologies all have resource requirements, mostly in the form of metals, concrete and land
  + “policy makers have to acknowledge the fact that addressing environmental breakdown may require a direct downscaling of economic production and consumption in the wealthiest countries
* Von Stechow (2016): “lowering energy demand growth is key to managing these trade-offs and creating synergies across multiple energy-related [sustainable development] dimensions”
* IPCC (2022): “Rapid and deep changes in demand make it easier for every sector to reduce GHG emissions in the short and medium term”
  + “socio-cultural and lifestyle changes can accelerate climate change mitigation”
* IPCC (2014): Substantial reductions in GHG emissions over the next few decades can give us and the planet a better chance at effectively adapting to the changes
  + Effective mitigation will not be achieved if individual agents advance their own interests independently
* IPCC (2018): Demand- and supply-side measures are not an either-or question, they work in parallel with each other
* Why norm interventions instead of others?
  + Insert model of predictors of pro-environmental behaviors
    - Norms likely easier to change in this model than others, like values (see Ghazali, 2019)
  + Cheaper than using monetary incentives
  + Quicker than waiting on government regulations
  + Overall, norm interventions are cheap, easy to disseminate to a large audience, and have an established empirical literature
    - But other methods requiring greater resources should still be pursued! I am just one lowly graduate student, though
* History of norm interventions used to promote pro-environmental behaviors
  + History
  + Strengths & weaknesses
* Proposed ways of improving upon previous interventions
  + Expand range of norm types
  + Align with people’s self-interest / address underlying motivation to consume / appeal to the values of a broader audience (not just people who endorse pro-environmental values)
* Purpose of the current study: test the effectiveness of novel norm intervention conditions & in conjunction with framing conditions – the two haven’t been combined in previous studies (to my knowledge)
  + Framing conditions: De Dominicis et al. (2017)

**Snippets from prelim paper:**

Despite the severity of these consequences and the consistent messaging from scientists on the need for immediate action, the collective response from organizations, policy makers, and individuals has not been enough to reduce human emissions of greenhouse gases (GHGs), the primary driver of climate change, to sustainable levels.

the implementation of large-scale and dramatic changes to humans’ GHG emissions can still have a significant impact on limiting how catastrophic these environmental changes become (IPCC, 2021). Specifically, the IPCC has projected that it is possible to limit the average rise in global temperatures to only 1.5°C compared to pre-industrial times by reaching net-zero, or zero human emissions of GHGs, within the next 20 to 30 years (IPCC, 2021).

increased consumption of goods and services that emit GHGs when they are used and/or produced (e.g., meat, clothing, heating/cooling, cars) has been widely cited as a major contributor to climate change (IPCC & Edenhofer, 2014; IPCC, 2018; Ivanova et al., 2016; Ripple et al., 2020).

As a field with a long history of investigating the predictors of human behaviors and ways of changing them, social psychologists may be particularly well-suited to discovering the factors that contribute to unsustainable consumption and developing interventions that can achieve large-scale behavioral change in this behavioral domain

Typically, this has meant changing people’s perception of descriptive norms, most commonly defined as people’s perception of the behaviors most people engage in, and injunctive norms, most commonly defined as people’s perception of the behaviors most people think others *should* engage in (Farrow, Grolleau, & Ibanez, 2017). For example, presenting participants with the information that a large number of people in their group recycle would be a descriptive norm manipulation, and telling them that a large number of people in their group *approve* of people recycling would be an injunctive norm manipulation.

**Overview of the characteristics of currently used norm interventions in social psychology…**

* Most often manipulated types of norms
  + Descriptive
  + Injunctive (aka, social)
  + Sometimes personal
* Pro-environmental appeal / framework
  + Against self-interest
  + Likely appeals to people who endorse pro-environmental values
* No mention of underlying motivation to engage in environmentally *un*friendly habits

Critique: Generally small effect sizes & inconsistent effects across studies

**Four main areas for potential progress, including:**

**1. Expanding types of norms manipulated to explore effectiveness of larger range norm types**

- especially because effectiveness varies depending on the type of norm ( )

- expand to: descriptive (already there), convention (new), social norm (already there, but more detailed definition), moral norm (kind of already there because of the way personal norms tend to be measured, but…)

**2. Testing self-enhancing framings (that align desired pro-environmental behavior with people’s self-interest)**

- and this goes along with it not addressing people’s underlying motivation to engage in environmentally *un*friendly habits

- make message consistent with self-interest by explaining how a new, pro-environmental behavior aligns with pre-existing motivations to engage in the environmentally unfriendly habit

- Two framings: pro-environmental vs self-enhancing

-- norms PLUS framings haven’t been investigated before

3. **Current framings of the environmentally-relevant behavior likely appeal *more* to people high on pro-environmental value endorsement**

– the self-enhancing framing may reduce this moderating effect, aka appeal more strongly to a wider audience

**Overview of the characteristics of currently used norm interventions in social psychology…**

* Most often manipulated types of norms: of 23 studies reviewed in Farrow et al. (2017) that tested norm interventions…
  + Descriptive (13) – 68%
    - Bohner & Schlueter, 2014; Carrico & Riemer, 2011; Ferraro, Miranda, & Price, 2011; Goldstein et al., 2008; Lapinski et al., 2007; Nolan et al., 2008; Oceja & Berenguer, 2009; Reese, Loew, & Steffgen, 2014; Schultz, 1999; Schultz et al., 2007; Schultz, Khazian & Zaleski, 2008; Smith et al., 2012; Yeomans & Herberich, 2014
  + Injunctive (aka, social) (5) – 26%
    - Carrico & Riemer, 2011; de Groot, Abrahamse, & Jones, 2013; Handgraaf et al., 2013; Schultz, Khazian & Zaleski, 2008; Smith et al., 2012;
  + DN + IN: (5) – 26%
    - Allcott, 2009; Costa & Kahn, 2013; Oceja & Berenguer, 2009; Schultz et al., 2007; Schultz, Khazian & Zaleski, 2008;
  + Sometimes personal (1) – 5%
    - de Groot, Abrahamse, & Jones, 2013

Goldstein et al. (2008) is a study that is very often cited as evidence for the ability of norm interventions to produce pro-environmental behavioral changes. This study was conducted in the United States (US) and used normative messages in hotel rooms to encourage guests to reuse their towels. In study 1, hotel guests saw either a **standard environmental message** or a **descriptive norm message** in their rooms. The standard environmental message (i.e., control condition) read, “**Help save the environment**. You can show your respect for nature and help save the environment by reusing your towels during your stay.” In the descriptive norm condition, the message guests saw in their rooms read, “**Join your fellow guests in helping to save the environment**. Almost 75% of guests who are asked to participate in our new resource savings program do help by using their towels more than once. You can join your fellow guests in this program to help save the environment by reusing your towels during your stay.” **The results were that people reused their towels significantly more in the descriptive norm condition compared to in the standard environmental message condition**.

Schultz et al. (2008) performed a study, also among participants from the US, that was similar to the original with the additional manipulation of whether hotel guests were told that it was a majority (high condition), or a minority (low condition), of other guests that engaged in, or endorsed, towel reuse behaviors. Unlike the original study, they also added an injunctive norm manipulation. The norm conditions were: **low/high descriptive norms** (“Nearly [25% / 75%] of hotel guests choose to reuse their towels each day. **To support our guests who want to conserve**, this hotel has initiated a conservation program. Please reuse the towels.”) and **low/high injunctive norms** (“[Some / Many] of our guests have expressed to us their approval of conserving energy. Bec**ause so many guests value conservation and are in the habit of conserving**, this hotel has initiated a conservation program. Please reuse the towels.”). The information in brackets varied between the low versus high conditions. The **control condition** simply read “This hotel has initiated a conservation program. Please reuse the towels.” There was also a condition that combined the high descriptive and high injunctive norm messages. Pairwise comparisons of each condition versus the control found that **only the combined condition produced significantly better towel reuse rates**. This differs from the original study that found that a descriptive norm message by itself was able to produce significantly better towel reuse rates compared to a standard environmental message

Reese et al. (2014) also attempted a replication of Goldstein et al. (2008) with mixed results. The participants in this study were hotel guests staying at resorts in Central Europe. This study compared the effects of a **standard condition** (“**Please help us to protect our environment** by re-using your towels.”), **hotel condition** (“**Follow your fellow hotel guests and please help us to protect our environment**: 75% of our hotel guests re-use their towels. You can join the other hotel guests by also re-using your towel.”), and **room condition** (“**Follow your fellow guests and help us to protect our environment**: 75% of our guests who were in this room re-use their towels. You can join the other guests of this room by also re-using your towel.”) on the average number of towels used per person per day. **The room and hotel conditions were both descriptive norm manipulations**, but they varied on whether the reference group was other hotel guests or more specifically guests that stayed in the same room as the current guest. Unlike previous findings, **neither of the descriptive norm manipulations (the room condition nor the hotel condition) significantly differed from the standard condition**.

The most recent attempt to replicate Goldstein et al. (2008) was performed by Bohner and Schlüter (2014), which was conducted using a sample of hotel guests in Germany. In study 1, the authors presented hotel guests with either a **standard environmental message** (“**Help to save the environment**. Every day we clean a great number of towels, many of them are unused. Please help us to protect the environment. You can join us in this program to help save the environment by reusing your towel during your stay.”) or a **descriptive norm message** (“**Join your fellow guests in helping to save the environment** … 75% of the [guests / guests who stayed in this room] participated in our new resource savings program by using their towel more than once. You can join your fellow guests in this program to help save the environment by reusing your towel during your stay.”). The information in brackets varied between descriptive norm conditions which changed who the reference group was in relation to the current guest (either hotel guests in general or guests who stayed in the same room as the current guest). In this study, the researchers found that towel reuse rates were actually the best in the standard environmental message condition. Similarly to the two replication studies mentioned above, **the differences between the descriptive norm conditions and the standard environmental message condition were not significant**

Lapinski et al. (2007) manipulated descriptive norms to test the effects on intentions to engage in conservation behaviors (e.g., saving water). They compared a **low-prevalence condition** in which participants were told “only 3% of people in the university community **took steps to conserve water** in the year prior to the study” to a **high-prevalence conditio**n in which participants were told that “about 90% of people reported **taking steps to conserve** in the year prior to the study.” The **high-prevalence condition establishes a descriptive norm that is pro-conservation behaviors**. There was **no main effect of norm condition on intentions to engage in conservation behaviors**. However, there was a **significant interaction between norm condition and group orientation**. Group orientation was defined as the degree to which individuals prioritized group goals over individual goals (e.g., “I usually sacrifice my self-interest for the benefit of the group”). For those who **were high on group orientation, there was no difference in their intentions to engage in conservation behaviors between the low- and high-prevalence conditions; they always expressed a high degree of intention to engage in conservation behaviors. However, for those who were low on group orientation, intentions to engage in conservation behaviors were *lower* in the high-prevalence condition compared to the low-prevalence condition**. In other words, **for people more concerned with individualistic goals than group goals, being told that a majority of other people engage in conservation behaviors decreased their own intentions to adopt these behaviors compared to when they were told that only a minority of other people engage in conservation behavior**s. This suggests that, for some individuals, **exposure to a normative message might actually have a backlash effect**. for **participants who endorsed individualistic goals over group goals, exposure to the pro-conservation descriptive norm actually *decreased* intentions to engage in conservation behaviors**

Smith et al. (2012) performed a study investigating the effects of descriptive and injunctive norm manipulations and whether the messages were stated to be supportive, or unsupportive, of the desired behavior, on people’s intentions to engage in energy conservation. Study 1 was conducted among a sample of Australian university students. The **supportive, descriptive norm condition** stated that 82% of the student sample **engaged in energy conservation**, whereas the **unsupportive, descriptive norm condition** stated that only 22% of the student sample engaged in energy conservation. The **supportive, injunctive norm conditio**n stated that 85% of the student sample **approved of other students who engaged in energy conservation**, and the **unsupportive, injunctive norm condition** stated that only 23% of the student sample approved of other students who engaged in energy conservation. The study found that **the combination of the supportive descriptive norm with the supportive injunctive norm produced the highest intentions to conserve energy compared to the other three conditions**. When paired with an unsupportive descriptive norm, though, a supportive injunctive norm had no significant effect on intentions to conserve energy compared to an unsupportive injunctive norm. In study 2, the same norm manipulations were tested using student samples collected from a Chinese university and a United Kingdom (UK) university. Although the students recruited from the university in China on average scored higher on personal endorsement of collectivist values compared to the students recruited from the university in the UK, the same pattern for the effect of norm condition on pro-environmental intentions was found. That is, in both samples, **the combination of the supportive descriptive norm with the supportive injunctive norm produced the highest intentions to conserve energy, and when paired with an unsupportive descriptive norm, the injunctive norm had no effect**.

de Groot, Abrahamse, and Jones (2013) investigated how an injunctive norm and a personal norm would affect shoppers’ use of plastic bags. This study was conducted by placing normative messages in supermarkets across the UK. Shoppers read a message from one of the following conditions as they were shopping in a grocery store: **injunctive norm** (“Shoppers in this store **believe that re-using shopping bags is a worthwhile way to help the environment**. Please continue to re-use your bags.”), **personal norm** (“We **thank you for helping the environment** by continuing to re-use your bags.”), **combined norms** (“Shoppers in this store believe that re-using shopping bags is a worthwhile way to help the environment. Please continue to re-use your bags. We thank you for helping the environment by continuing to re-use your bags.”), or a **standard environmental message** (“Caring for the environment. Reuse your bags.”). This was one of the few studies that included personal norms, a less commonly manipulated type of norm, as one of the norm intervention conditions. **Personal norms are commonly defined in this literature as the standards of behavior people set for themselves which are usually upheld by feelings of moral obligation (Stern, 2000).** This study found that UK shoppers elected to use **significantly fewer plastic bags when checking out in the injunctive norm condition, and in the combined norms condition, compared to the standard environmental message condition**. Descriptively, people used fewer plastic bags in the personal norm condition compared to the standard environmental message condition, but the difference was not significant

* Pro-environmental appeal / framework
  + Against self-interest
  + Likely appeals to people who endorse pro-environmental values
* No mention of underlying motivation to engage in environmentally *un*friendly habits