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Transnational analysis of behaviours to be changed

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LIST OF ABBREVIATIONS

ADEME	Agence de la transition écologique
CBSM	Community-Based Social Marketing
CE	Circular Economy
DECOP	DECO PROTESTE LDA
EC	European Commission
EEE	Electrical and Electronic Equipment
EU	European Union
OCU	OCU EDICIONES SA
TPB	Theory of Planned Behaviour
UK	United Kingdom
VBN	Value-Belief-Norms
WEEE	Waste from Electrical and Electronic Equipment

Table of contents

Introduction

The issue of repairing emerged in last years, in connection with the concept of “waste hierarchy” and within the wider framework of circular economy (hereafter CE).

The so-called “waste hierarchy” is the pillar principle of European Union regulation on waste management (Reggiani and Silvestri, 2018), according to which waste policy should be guided firstly by the objective of preventing waste production as much as possible, secondly by promoting the reuse of end-of-life products or at least their components, and subsequently recycling, secondary recovery or final disposal (Massarutto, 2023).

The traditional description of the waste hierarchy, based on the European Parliament and Council Directive 2008/98/EC, identifies six ladders of possible treatment of waste, from the lowest and least efficient of landfilling to the highest and most efficient of designing products to minimize the consequent end-of-life scrap. However, recent interpretations counts up to 11 “R” actions to be implemented to climb the ladder of a waste policy inspired to circularity (Potting et al. (2017)).

At the bottom of the ladder is the invitation to “Recover energy” (R10), meaning establishing Waste to Energy plants aimed to extract biogas from waste incineration.

The first step ahead is “Recover materials” (R9), obtained from the selection of new materials, different from the original ones. One step upward we find “Recycle” (R8), i.e., processing waste to obtain the same material to be used in the production process, saving “virgin” raw materials. Similarly, “Reprocess” (R7) implies using exhausted products for different purposes. Still in the track of redirecting materials after the first use is “Rebuild” (R6), i.e., sifting exhausted products to mine components that may still be functioning.

A new, superior block of circular actions concentrates on extending the durability of products. They start from “Renovate” (R5), or reconditioning exhausted products, typically electrical and electronic equipment (hereafter EEE). The next level is where we meet “Repair” (R4), described as removing and replacing used-up components to continue employing the product, while the last action of this block is “Reuse” (R3), related to the second-hand use of products, e.g., refillable containers or furniture abandoned by the first owner and rescued by new utilizers.

The upper block, inspired to get eco-efficiency through both a new design and a new way of using for products and processes, includes “Reduce” (R2) material and energy consumption (less input for the same output), “Rethink” (R1) the use of products avoiding downtime as much as possible

(e.g., resorting to sharing and leasing), and “Replace” (R0), implying obtaining a similar function from a different product or service.

This transnational analysis aims to provide actionable insights for policymakers and stakeholders to implement behavioral nudges that foster a repair-oriented culture across diverse contexts. REPPER aspires to trigger cultural changes in the Euro-Mediterranean community by shaping consumer attitudes and habits through targeted nudges.

Within the project, Activity 3.1 “REPper Nudge Piloting” aims to identify possible nudging and behavioural strategies that can modify people's attitudes toward repair and, consequently, make repair an increasingly feasible and appealing option. To achieve this, two distinct Deliverables are planned within Activity 3.1: the present document, D 3.1.1, is the first one, and its goal is to analyze citizens' current perceptions and behaviours toward repair, as well as to identify the main obstacles that, in many cases, make repair a less desirable option compared to replacement. Deliverable D 3.1.2, “List of identified nudging and blueprint” builds on the results of D 3.1.1 and the analysis of initiatives already implemented in REPper countries to develop a set of behavioural strategies aimed to promote repair in the project area.

To deal with the specific task assigned, D 3.1.1 is divided into four Sections: Section 1 introduces the behavioural science approach, which relies on the recognition of bounded rationality and claims for the influence of perceptions and social preferences on consumers’ choices; Section 2 contains and analyses how repairing activities have been studied by social sciences, with the contribution and the interpretation of psychology, anthropology, sociology, and technical studies; finally, Section 3 presents the results of numerous studies carried out in REPper countries on consumers’ attitude towards repair, and draws some general conclusions.

1. The behavioural science approach

Behavioural sciences paint a picture of complex human behaviour that is influenced by a diversity of factors, such as desires and needs, social norms and values, infrastructural and institutional context, and economic and political climate (Heiskanen et al., 2013). Insights from behavioural sciences can help policymakers to devise more effective policies for advancing welfare-enhancing and sustainable behaviour.

The complex nature of human behaviour is explained by several theoretical frameworks from varying fields of study. More than 80 different theories of behaviour and behavioural change exist across the fields of psychology, sociology, anthropology and economics (Darnton, 2008; Davis et al., 2015). Widely used in the sector of public health, the use of theory-based behavioural intervention has known a recent enforcement even in environmental policies.

Informative policy instruments rely on the rational behaviour model, according to which people are utility maximisers with perfect information processing capacity (Lehner et al., 2016). These assumptions about human nature were questioned by cognitive and social psychologists and even economists since the 1950s (Simon, 1957; Tversky and Kahneman, 1974).

Behavioural economics is a field that blends insights from psychology with traditional economics to better understand human decision-making. Unlike classical economics, which assumes that individuals are rational agents who always make decisions that maximize their utility, behavioural economics recognizes that people often act irrationally due to cognitive biases, emotions, and social influences.

The key concepts in behavioural economics starts from bounded rationality (Simon, 1957), suggesting that people have limited cognitive resources, such as time and attention, which prevent them from making perfectly rational decisions. Instead, they rely on heuristics or mental shortcuts to make choices, which can lead to errors or biases. Far from being perfectly rational, agents tend to apply heuristics (i.e., mental rules of thumb) to simplify decision-making, a strategy that can lead to systematic errors or biases.

Kahneman and Tversky (1974) highlight several such biases, including loss aversion (the fact that people tend to fear losses more than they value equivalent gains), anchoring (people’s decisions are influenced by an initial reference point or "anchor," even if it is irrelevant), framing effects (the way information is presented can significantly impact decision-making, for example presenting a treatment as 90% successful or 10% unsuccessful). Other biases are given by time inconsistency, i.e., the fact that individuals tend to value immediate rewards more than future ones (hyperbolic discounting, Rubinstein, 2003), leading to procrastination or under-saving for retirement, and prospect theory, which claims that, due to loss aversion,

agents tend to make decisions based on perceived gains rather than actual outcomes.

Behavioural economics also explores how social factors influence decision-making, remarking that people care about fairness, reciprocity, and social norms, not just personal financial gain. This can influence decisions in ways that standard economic models might not predict. We can classify behavioural change into different categories (Parajuly et al., 2020).

The first one is the Theory of Planned Behaviour (hereafter TPB), representing a typical application of the rational choice theories (Kaiser et al., 1999) to environmental issues (Botetzagias et al., 2015). The TPB suggests that agents' actual behaviour is the result of social norms combined with individual's perception of behavioural control (Ajzen, 1991). The TPB has been used as a framework to study consumers' e-waste disposal intentions in China (Wang et al., 2016), Vietnam (Le et al., 2013), Nigeria (Nduneseokwu et al., 2017), and Brazil (Echegaray and Hansstein, 2017), and the consumers' purchase intentions of remanufactured e-products (Jiménez-Parra et al., 2014). Criticisms regards the potential indirect influence of external factors (demography, socio economic factors etc.), which may challenge the generalized applicability of the TPB, and the fact that only few intentions translate into behaviours (the so-called "intention-behaviour gap", Bamberg, 2013).

A second class of behavioural change are Moral theories, which focus on the higher driving force of positive self-concept rather than economic self-interest motivating people's actions (Bolderdijk et al., 2012). According to this theory, behavioural change driven by intrinsic motivators is longer lasting than external rewards. The Value-Belief-Norms (hereafter VBN) theory is arguably the most popular of moral theories, particularly in investigating pro-environmental behaviour (Bronfman et al., 2015; Janmaimool and Denpaiboon, 2016). The theory suggests that behavioural change appears more likely when people value the collective wellbeing over personal interest. The VBN theory was used to evaluate residents' willingness to participate in e-waste in USA (Saphores et al., 2012) and to examine consumers' perceptions towards reuse and recycling of e-products in Finland (Yla-Mella et al., 2015).

The third one is Community-Based Social Marketing (hereafter CBSM), which exploits the evidence that people are more likely to follow what others do (Liebig and Rommel, 2014). A merger of knowledge from psychology and social marketing, CBSM is proposed as a pragmatic alternative to traditional information-intensive campaigns for behavioural change (McKenzie Mohr, 2000). It is a strategic planning process that uses marketing principles and techniques to influence behavioural changes that benefit society and the individual (Salazar et al., 2019). Social marketing is compared with education and law as one of the three major tools for behavioural change with the claim that the toolbox of social marketing has more options than other

theories and frameworks for behavioural change (Parajuly et al., 2020). The tools used by CBSM include communication, incentives, norming and social diffusion, and show to be very effective in changing consumer behaviour (O'Rourke and Lollo, 2015). On the other hand, being quite demanding in time and money has been highlighted as the major issue in implementing this strategy (Haldeman and Turner, 2009).

After the international success known by the 2008 book by Richard Thaler and Cass Sunstein and the awarding of the Nobel Prize in economics in 2017 to Thaler himself, nudging is undoubtedly the most popular and cited among behavioural change strategies. Based on the two notions of choice architecture and libertarian paternalism, nudging represents the idea of altering people's behaviour without restricting their freedom of choice (Thaler & Sunstein 2008), and paternalizing them with a gentle push towards the right choice (Leonard, 2008).

It stands on the assumption that humans are not exclusively rational beings and do not always act based on their knowledge and intentions because their decision-making is often not mindful and can be influenced by heuristics and biases (Parajuly et al., 2020). It involves driving people in a direction that improves their well-being, often by making the desired option the easiest or default option (choice architecture). Furthermore, it is a form of soft intervention, as opposed to hard mandates or bans, guiding people towards what authorities judge to be better decisions (paternalism) without restricting their freedom to opt-out (libertarianism). Even for this reason, nudging interventions are considered inexpensive – or low-cost - to implement, compared to more traditional policies, mostly when based on financial incentives.

Typical of nudging is setting one or more default options, that align with better outcomes and significantly influence behaviour. For example, automatically enrolling employees in retirement savings plans increases participation rates, as opting out requires an active decision. Setting a default option that can significantly influence behaviour. The design of the environment in which people make decisions (e.g., the layout of options on a menu or a form) can influence outcomes. Thus, by carefully structuring choices, policymakers can nudge people toward better decisions. Other features of nudging are making options more prominent or accessible (salience, priming and simplification), providing immediate feedback on decisions (such as energy usage compared to neighbours) and small incentives, or encouraging people to commit to future actions, helping them overcome present bias and stick to long-term goals.

In recent years, nudging has been increasingly used as an umbrella term and is known as a low-cost solution for promoting pro-environmental behaviour (Ölander and Thøgersen, 2014; Gsottbauer and van den Bergh, 2010). Nudges have been tested and reported to be effective in reducing

food waste (Kallbekken and Saelen, 2013) and plastic waste (Rivers et al., 2017), and promoting green energy (Ebeling and Lotz, 2015)

While nudging has gained widespread popularity, it is not without criticism. Despite attempts to make nudges transparent, nudging policies are frequently alleged to be subtle and oblique to decision-makers (Hausman and Welch, 2010; Rebonato, 2014; Sunstein, 2015), in addition to potentially manipulative (Goodwin, 2012). One possible answer to this critique is that, when accusing nudging of altering choice architecture, one should also consider that choice architecture is, in many cases, inevitable, and that options can rarely be framed in a neutral way (Thaler & Sunstein 2008). Other authors remark the dependency of nudges' effectiveness on situated factors, so that they may not work in different contexts (Momsen and Stoerk, 2014), and their over-reliance and short-termism, identifying nudging as a superficial solution to deeper, structural problems.

In conclusion, behavioural economics represents a shift from traditional economic thinking, offering insights into the psychological factors that influence decision-making. By recognizing that people are not always rational and take suboptimal decisions, policy-makers can design interventions that account for this, promoting better outcomes. In this context, one of the most popular strategies is nudging, which provides – mostly in environmental related issues - tools to steer people toward better choices without limiting their freedom.

2. A multidiscipline approach to repairing

Before being considered by economic science, mostly if not completely related to the issue of CE, repairing found room in the scientific treatment of psychology, anthropology, sociology, science and technological studies (McLaren et al., 2020).

The **psychological approach to repairing** intercepts notions such as personal values and ethics (McLaren et al., 2020), care (Houston, 2019), and emotional attachment (Chapman, 2005; Errazuriz, 2019). The purposes, motivations, and values involved in repair are not simply about the restoration of material objects for instrumental and functional reasons. They involve attachment, relationships and efforts to redefine values and ethics, as a part of individual responsibility coherent with austerity politics and the creation of new consumption norms rooted in nostalgia for imagined pasts (such as *vintage* fashion) or, the other way round, as the refusal of extended corporate control over property, the commodification of waste and domestic labour (McLaren et al., 2020).

Errazuriz (2019) describes repairing as a "commitment in action" that generates a close relationship between people and objects and can lead to long-lasting relationships. In this sense, repair works as a strategy to conserve the value and affirm the function of objects within people's homes. Everyday care also implies recognising objects' fragility, i.e., being in a state of functioning but also submitted to increasing obsolescence. Repairing restores the daily practices of objects and therefore it is central to stability and order in personal life (Gregson et al., 2009). Furthermore, repair practices are pedagogical sites building expertise as constitutive elements of subjectivity (Graziano and Trogal, 2017).

Implicit and explicit moral dimensions of repairing entail on one hand that consumerism relaxed personal relations with artefacts and, consequently, responsible consumption and production; on the other hand, that repair is at once means and ends by which to experience and express such meaningfulness (Hielscher and Jaeger-Erben, 2021).

Another issue related to the psychological facets of repairing is given by the juxtaposition of the visible and invisible elements (Denis and Pontille, 2017; Kuipers et al., 2018). Transformative repairing that ends in conspicuous mending highlights the materiality of the objects, helping a conceptualization of repair as a practice that confers meaning, rather than a technical matter of fixing a problem. Conversely, inconspicuous repair is compatible with a remote and specialised activity, proper of advanced industrial societies. The latter is indifferent to the value of repairing as a distinct epistemological activity, focusing crudely on the restored functioning of the repaired artefact *per se* (Lee and Wakefield-Rann, 2021).

Finally, it must be noticed that emotional attachment may be different according to the type of object that needs repairing, and the symbolic value it entails. For instance, the symbolic significance attached to a flag patriotically displayed outside the house, may compel the owner to replace rather than restoring it once it is damaged (Lee and Wakefield-Rann, 2021).

Anthropologic studies focus on repairing as a cultural practice, emphasizing the role of collective venues such as maker-spaces and Repair Cafés (McLaren et al., 2020). Motivations and modalities of repair are analysed stressing the interpretation of its real nature as an individual consumer action, or a form of collective resistance to consumerism (Rosner, 2013; Ratto and Boler, 2014).

Not surprisingly, scientific analyses on repairing flourished when repairing begun to be perceived as a collaborative act (Houston et al., 2016). Repair collective initiatives have experienced a significant upswing in many industrialized countries in recent years (Keiller and Charter, 2014), where they have been considered as an emancipatory act for people claiming their right to repair (Repair Manifesto, Right to Repair movement), mobilizing collectively to defend the individual interest in repairing. Furthermore, these initiatives offer shared responses contrasting with producer responsibility approaches, which mediate repair through a corporate-consumer relationship (Graziano and Trogal, 2017).

Nonetheless, repair (and reuse) can be seen as an element of an emerging eco-consumer habitus (Carfagna et al., 2014; Podkalicka and Potts, 2013), strictly related to well-off people and paralleled by urban gentrification, ending in tangible social exclusion (Lees, 2008; Luke and Kaika, 2019). Anti-consumerism, sustainability and anti-waste values might seem to flow together; but repair often triggers more consumer behaviours. Commodifying the repair urge and using it for marketing purposes is a predictable response from businesses. Repair as a 'fashionable activity' is also implicated in the growth of consumer markets for tools and equipment (Bix, 2009; Watson and Shove, 2008), although tool libraries and shared repair facilities offer an alternative route implying more limited material rebound effects.

Another contested point in the anthropologic perspective is the forward-looking or nostalgic attitude of repairing: on one hand, Vinsel (2017) remarks the emphasis on a happy past characterized by austerity and the need to repair and reuse objects, while on the other hand Graziano and Trogal (2017) and Isenhour and Reno (2019) highlight its progressive and transformation of practices afflatus.

The **sociology of repair** concentrates on how repair and maintenance relate to social values and systems (Henke, 2000; Sennett, 2012; Martínez, 2017). In this sense, repair is a way of acting within society which co-creates cultural values, social and economic relations and material outcomes.

Scholars largely agree that repair is necessarily relational, and affects social relations and identities as much as it has material consequences (Sormani et al., 2019; Rosner, 2014). Repair practices involve activities located within social and institutional relations (Henke, 2000; 2017; 2019). They are essential to the maintenance of existing patterns of social relations (Schubert, 2019; Carr, 2017), but can reconstitute or disrupt power hierarchies and social orders as well (Gregson et al., 2009; Jacobs and Cairns, 2012; Jackson, 2014). Repair and maintenance may alternatively challenge technocratic models of progress and growth, providing improvisation and social innovation (Graham and Thrift, 2007).

Another issue addressed by the sociology of repair deals with its relational scope, wondering about the type of repairing activities performed at home in contrast with the ones made by practitioners from repair network organisations, and collective initiatives such as Repair Cafés (Gregson, 2007; Bix, 2009; Hielscher and Jaeger-Erben, 2021). The issue is extended in a comparison with aftersales repairing activities too, where collective initiatives are viewed as tools to create spaces for social innovation and co-produced processes, rather than to maintain existing social and market relations (McLaren, 2018), and the other repairing activities co-opted by new circular business models in which sociality is displaced, waste commodified and industrial consumer society sustained (Savini, 2019).

Repair has a new attention in **economics** after it has been recognized as a relevant subject within the narrative on CE (McLaren et al., 2020). Before this, maintenance and repair activities were neglected and vastly understudied topics, due to the prevailing concentration on the linear model from production to consumption. A second economic issue related to repairing concerns the interaction between consumers and manufacturers in the market of EEE and the parallel market of repaired devices.

Growing academic and policymaker interest in CE and sustainability has led to increased research into reuse and repair (Wieser and Troeger, 2018), even though the literature on CE is expanding more widely and rapidly than the one on the role of repair.

A recent review on the connection between the two concepts shows a significant number of scientific papers (namely 119) using both the terms “Circular Economy” and “Repair”, starting in 2010 and increasing year after year to 47 in 2019 (McLaren et al., 2020). The main part of this literature sees repair as a tool to extend the useful residence time of resources in the economy through product life extension, increasing resource efficiency and preventing waste: by repairing products, both waste and resource extraction can be reduced (Milios, 2018; Ludeke Freund et al., 2019).

Only a small minority of papers, lower than 20%, identify non-instrumental motivations for repair, such as stimulating creativity, attachment or solidarity (Spring and Araujo, 2017; Mendoza et al., 2019; Mugge, 2017;

Dermody et al., 2020), typically papers which treat the functioning of Repair Cafés, and maker spaces (Williams et al., 2017; Prendeville et al., 2016; Ghisellini et al., 2016). Even more rarely authors consider cultural or emotional influences, divorcing repair from consumer behaviour and the consumer-manufacturer interaction.

From the consumer point of view, there are factors different from repair cost that can influence repair and replacement decisions: they are service availability, spare parts accessibility, and personal information concerns. Consumers prefer to spend a limited budget to repair a product over its life span (McCollough, 2009). Therefore, the pricing of repair services drastically affects the rate of repair (Barrot et al., 2013). Accessibility, availability, and convenience of repair infrastructures are other factors that significantly influence consumer's decision to repair (Houston et al., 2016). On the other hand, manufacturers are recently urged by environmental initiatives, e.g., the Digital Right to Repair Coalition, to design repairable products, share repair manuals with end users and independent repair businesses, extend the time horizon of warranty and repair services, and offer convenient waste recovery services (Sabbaghi et al., 2017).

The interaction between consumers and manufacturers in repairing activities has been particularly addressed by economists for EEE. Although public willingness to repair is increasing (Scott and Weaver, 2014), there are still barriers that discourage consumers from fixing broken products. The European policy framework on Waste from Electrical and Electronic Equipment (hereafter WEEE) promotes practices that extend the lifetime of EEE, mainly based on practices related with repair and second-hand markets.

This attitude is evident particularly in the mobile phone market. Consumers have different reasons to retire a currently-used phone such as perceiving physical obsolescence, having access to the cutting-edge technology, and requiring higher technical capabilities (Ongondo and Williams, 2011). Furthermore, the majority of consumers do not feel confident about the quality of remanufactured products (Matsumoto et al., 2017). In many cases, big brands ignore repair services and adopt marketing strategies based on trade-in rebates to foster brand loyalty, thereby decreasing phone longevity. It simply means that phone repair may not be of concern for manufacturers, a habit only recently questioned by the need to adopt corporate social and environmental responsibility objectives.

The decision not to repair a failed mobile phone results in a value leakage, in the form of economic loss that would affect both consumers and manufacturers as the primary stakeholders. The magnitude of value leakage is linked mainly to the time elapsed since the technology release date: Sabbaghi and Behdad (2018) estimate that consumers' willingness-to-pay for repair services decreases at an annual rate of 6.7% during the use phase of their mobile phones.

A critical review of repairing in social sciences highlights a dominant economic narrative that only recently escaped the simple market interaction among consumers and producers to associate the notion of repair with CE. This could end in supporting a neoliberal co-option of CE, which would undermine its underlying normative intent of enabling sustainability (McLaren et al., 2020).

Nonetheless, a wider perspective on repair including anthropology, sociology and ethics is more useful to perceive and underline its transformative potential. An instrumental and technocratic view of repair ignores a broad diversity of intentions, motivations and values. Furthermore, while repair might be induced by individual demands, it is not necessarily a product of rational consumer economic calculus. Much of the repair literature highlights the importance of emotional attachment, rather than the instrumental value (Isenhour and Reno, 2019; Berry et al., 2019; Bohlin, 2017; Callén Moreu and López Gómez, 2019; Rosner, 2014; Vinsel, 2017).

For policymaking, it would seem strongly desirable to have a better understanding of the contested dimensions of repair and underlying differences and diverging orientations: mobilising repair through mechanisms that focus on instrumental value, such as product service offerings, or tax breaks for repair might therefore be less effective than engaging with deeper motivations, even if presented to support environmental sustainability.

3. The perception of repairing among consumers

After presenting the theoretical framework in the first three Sections, here are presented the results from collected studied which have investigated the perception of consumers' towards repair in partner countries.

Understanding the level of awareness within the target population regarding concepts such as CE and "repair economy", as well as those factors that may positively (or negatively) influence circular behaviours, is essential for formulating effective nudging and behavioural strategies able to improve attitudes towards CE and repair in the Euro-MED area.

Numerous **cross-country studies** have attempted to address this topic by simultaneously collecting information from multiple European States.

A recent paper investigated consumers' knowledge and decisions when dealing with circular concepts and behaviours in Albania, Poland and Portugal (Duarte et al., 2024). The study was conducted through a survey, which received 95 answers from Albania, 138 answers from Portugal, and 262 answers from Poland. The study revealed several key findings. Overall, residents of the EU countries (Poland and Portugal), demonstrated greater awareness of the CE concept compared to Albania. However, no distinct patterns were observed across different countries regarding place of living (rural village, small city, large city etc.). Males had a better self-perception of their CE knowledge compared to females, and individuals with higher levels of education were more likely to understand the concept of CE. In Albania, there were fewer positive responses to second-hand purchases compared to Poland and Portugal. Although the size of the city did not significantly affect second-hand purchases, some insights indicated a more active market in rural areas. Females and Generation Z were more inclined to engage in second-hand purchases, while education did not play a significant role in these decisions. Price influenced buying behaviours differently across nationalities; Portuguese respondents generally avoided impulsive purchases at all price levels, Polish respondents adopted a more circular approach for higher-priced and low-priced items but not for mid-range products, and Albanians showed a linear purchasing approach across all price ranges (i.e., they tend to buy new products no matter the price). In general, EU countries exhibited a more circular approach to consumption. As a conclusion, nationality was a significant factor in perceived CE knowledge and second-hand purchases. Gender and generational differences were evident in second-hand purchases, while education influenced perceived CE knowledge but not second-hand buying behaviour. Finally, price affected purchasing decisions differently depending on nationality.

In May 2022, as part of the CircThread project, financed by the EU Horizon 2020 Programme, Euroconsumers conducted a survey in four European countries (Spain, Italy, Portugal, and Belgium) where users were asked,

among others, if they had experienced any breakdowns and repairs in the past five years. Most respondents confirmed they had been faced with a breakdown (minor, major, or both) in the previous five years, with the only exception of heating systems (53% had not experienced a breakdown). Large household appliances were found to be the products most affected by major breakdowns (37%). Most of the users sought repair when faced with a breakdown. Around 40% tried to repair small household appliances or high tech by themselves or with a relative/friend, especially when minor breakdowns occurred, while heating systems are primarily repaired through authorized repair services. Belgian users resulted to be the ones trying most to repair all 3 product categories by themselves or with help, followed by Italians. The main reasons users chose not to repair products were the high cost of repairs, the perception that the products were too old or at the end of their life cycle, and a preference for purchasing new products. An additional reason for not repairing heating systems was that owners thought they could live with the problem. Lack of information and repairing skills, though it constituted an obstacle, was not considered a major barrier. The cost of repairing small household appliances was considered the most frequent obstacle to repair in Italy (46%), unlike in other countries. In Spain, 48% of users chose to buy a new small household appliance over repair, and more than 20% tried to live with the problem affecting their high tech. The cost of repairing large houshold appliances, on the other hand, was a less frequent obstacle for Portuguese users (37%) compared to other countries. Finally, around 30% of Belgian and Portuguese users tended to live with the problem affecting their heating systems.

Another study published in 2023, involving 922 volunteers from 14 countries, including Italy, France, and Spain, investigated the factors driving behavioural change for e-product repair behaviour (Parajuly et al., 2023). It considered the behavioural factors which motivate and enable the respondents to the survey (volunteers and professionals) to repair e-products. The factors considered have been broadly grouped into three distinct categories, namely consumer behaviour, techno-economic settings, and intervention strategies. Results of the study indicate that: subjective norms and attitude are the two most significant predictors of participation in public repair events, such as Repair Cafés, meaning that product repair activities are driven by how people feel about the act of repair and the social aspects of the process; when it comes to product repair at home, attitude and perceived behavioural control are decisive, suggesting that it is also important to have the skill sets, and not just the intention, to perform the repair; electrical appliances are perceived to be easier and more convenient to repair than electronic equipment, including the access to tools, spare parts, and the knowledge required to perform the task; techno-economic factors and education play a significant influence on the intention to repair. The formers seem to be directly linked to an individual's confidence to perform a behaviour with given resources and opportunities (perceived behavioural control), while the latter directly influences an individual's

attitude towards repair and subjective norms (social pressure to perform or not repair).

In addition to cross-country studies, several **single-country studies** have been examined.

In **Bosnia**, an insightful study has been conducted by the University of Sarajevo, School of Economics and Business in August 2024. The online questionnaire received a total of 450 answers and, although the sample is not representative of the whole Bosnian population (81% of respondents were females, and the same percentage of respondents graduated at university), it can still provide useful information about consumers' perception toward CE and repair in the country.

According to respondents, Bosnian entities such as educational institutions, media, and local authorities do not give enough attention to environmental protection. At the same time, respondents express a willingness to change their daily habits to reduce their environmental impact, with environmental protection being a priority in their lives. Most respondents prefer to use products longer or repair them instead of buying new ones, though they feel there are not enough repair experts in their communities. Many are interested in learning more about reuse, upcycling, or product repair, and believe that manufacturers and traders provide insufficient information about consumer rights regarding product repair. While 57% of respondents have never repaired a product themselves, the most commonly repaired products include small household appliances, apparel, furniture, and large household appliances.

No socio-demographic factors significantly predict whether someone repairs products. Additionally, 47% of respondents have upcycled old products into new items at least once, with apparel, furniture, and household containers being the most commonly upcycled. Gender is a significant predictor of upcycling, with female respondents being more likely to engage in the practice than males, while other socio-demographic factors like age, education, and income do not have a significant impact. Moreover, 72% of respondents have exercised their consumer rights to repair or replace a product at least once. When products reach the end of their useful life, respondents are most likely to donate or dispose of them, and when products break or are damaged, they tend to have them repaired, dispose of them, or recycle them. The main reasons for replacing products with new ones are malfunction, damage, obsolescence, or fashion trends. The study also investigated factors influencing the choice to repair or not to repair goods. The five main reasons that would motivate respondents to use and/or repair existing (old) products for a longer time have found to be:

1. Extension of the product's useful life (17.2%)
2. Environmental awareness (16.2%)
3. Financial savings (13.6%)

4. Creativity and enjoyment (9.1%)
5. Emotional attachment to the product (8.9%)

Conversely, the main factors discouraging respondents from prolonging the use and/or repairing of existing (old) products are:

1. Obsolescence of the product (14.8%)
2. [Poor] availability of professional repair services (11.9%)
3. Cost of servicing/repair (10.5%)
4. Lack of information or necessary knowledge for repair (10.3%)
5. New products are more advanced than old ones (10.2%)

In **France**, different studies have been conducted. In 2021, a study investigated the current state of the art in behavioural social sciences about the conservation, reuse, repair and sorting of end-of-life smartphones, and more specifically at the determinants of these behaviours. The second objective was to highlight the obstacles and motivating factors of such behaviours, and find possible strategies to address these obstacles. The study found that storage of the product, the default behaviour when it comes to end-of-life smartphones, is determined by a lack of information about alternative behaviours (reuse, repair or recycling), which can give rise to fears, such as that of having one's personal data exploited. Storage is also determined by the perceived value or usefulness of the smartphone, a perception that is sometimes misguided either because of a pronounced attachment and (in rare cases) considered pathological, or because of cognitive biases such as aversion to dispossession. Conservation may also result from a lack of interest for the disposal of the old smartphone. On the whole, the drivers that favor storage disadvantage the other three behaviours (reuse, repair, recycling) and vice versa. Specifically, repair is influenced by the perceived value of the cost of repair or the benefits of the smartphone once repaired, especially in comparison with a new smartphone. Lack of information can also slow down the intention to repair, as can the difficulty of repair or the feeling of programmed obsolescence, which can discourage and reinforce the desire to change smartphones.

Another analysis performed by the the French Agency of Ecological Transition ADEME[1] found out that, although 81% of French people have a good image of repair, only 36% actually choose it. The main obstacle to choosing repair is price: 68% of French people believe that cost is an obstacle to repair. Moreover, repair becomes a less appealing option once the warranty has expired: only 10% of non-warranty electrical and electronic appliances are repaired – according to ADEME.

Finally, in 2023, the French Directorate for Government Transformation, together with General Commission for Sustainable Development,

[1] https://librairie.ademe.fr/ged/338/infographie-etude-francais-reparation-2019_synthese.pdf?modal=false

commissioned the UK Behavioural Insights Team to conduct the first impact evaluation of the Repairability Index on consumer choices[2]. This index was introduced in France in 2021 with the aim of rating products based on their ease of repair and informing consumers about this characteristic. This analysis showed:

- A positive, but not statistically significant, effect of the introduction of the index on sales of repairable products compared with less repairable products. There was a clear increase in the sale of more repairable products, but this cannot be attributed with sufficient confidence to the introduction of the index alone;
- That the introduction of the index had a positive and statistically significant effect on sales of more repairable products online, and a positive (but not significant) effect on those products sold in shops;
- That the two retailers studied sold increasingly repairable products in greater proportions than less repairable products;
- That, since the introduction of the index, product scores have increased, underlining the positive effects on the range of products offered to consumers, with new models that are increasingly repairable.

In **Greece**, a recent study attempted to investigate the attitude and behaviour of Greek consumers in relation to prevention, preparation for reuse (repair) and recycling of a specific category of products, namely WEEE (Abeliotis et al., 2021). The analysis of the responses to the questionnaires showed that the majority of Greek households chose not to repair broken devices and bought new ones instead. Additionally, a significant percentage of respondents stored the devices they no longer used in their homes. When the general financial situation was declining, households and businesses avoided the purchase of new EEE. The highest rates of repair were reported for screens and equipment with screens (94%) and small IT and telecommunication equipment (80%).

On the opposite, the lowest repair percentage was reported for large size equipment (57%). At the time the survey was conducted, in 2018, repairers perceived that consumers in Greece had a positive attitude towards repair, especially for some categories of products, such as temperature exchange equipment, equipment with screens larger than 100 cm^2, and small IT and telecommunications equipment. The most important reasons that discouraged consumers from repairing their electrical and electronic devices were the high cost of parts and labour, accounting for 58.01% of respondents. This is followed by the low cost of buying a new device at 15.85%, and the difficulty of finding professional personnel to repair the device at 15.20%. Finally, some consumers prefer not to repair EEE because they do not trust the quality of the product after repair.

[2] https://www.modernisation.gouv.fr/publications/indice-de-reparabilite-quel-impact-sur-lachat-de-produits-plus-repara bles

Conversely, factors that would encourage consumers to engage more in repair activities are: (i) extension of product legal guarantees, (ii) EEE manufacturers initiatives towards repair, (iii) households networking, (iv) networking of independent repairers on web-based platforms, and (v) training of the general public to minor repairs.

In **Italy**, a recent survey conducted by Circular Economy Network and Legacoop, in collaboration with IPSOS, confirms Italians' interest in CE. In the past three years, 45% of respondents have purchased a used product, and 36% have bought a reconditioned or regenerated product. When a product stops working, Italians are most likely to attempt repairs on cars and motorbikes (50%), large household appliances (43%), and bicycles and scooters (41%), with lower repair attempts for tech products (39%), furniture (33%), and clothing (27%). Reluctance to repair is mainly due to high costs, non-repairable design of tech products and appliances, lack of professionalism in repairing clothing, furniture, and bicycles/scooters, and long repair times for cars and motorbikes. Additionally, people prefer the latest models and view purchasing used or reconditioned products as a sign of low social status. Although seven out of ten Italians recognise the environmental benefits of buying refurbished or regenerated products, there are still many prejudices. Thirty-one percent consider these products hard to find, 36% consider them less reliable, and 46% see them as less durable. Additionally, many people prefer to have the latest model (28%) and are not accustomed to reuse (32%). Some associate buying used products with low social status (24%). If the product is not repairable, 69% opt for recycling, and 52% would send it for reuse.

Another research was carried out by project partner Altroconsumo in 2021, in collaboration with the University of Catania[3]. The study was conducted through an online survey, and involved 1,203 members of Altroconsumo, aged between 18 and 74, selected in order to be a representative sample of general population. Aim of the study was to collect from respondents reports and testimonies on issues and needs related to sustainability. Among the many aspects investigated by the survey, few questions were specifically related to the identification of respondents' attitude towards repair.

The survey results indicate diverse attitudes towards repair depending on product category. When it comes to ease of repair as a driver of purchase decisions, 28% of respondents consider it important for large household appliances, 22% for high-tech products, while it has no impact at all on purchases of clothing and furniture, with 0% reporting it as a factor. In the event of product damage, 48% of respondents would seek professional repair services for large appliances, while only 27% would consider self-repair. For clothing, 40% would consider professional repair services, but a

[3] file:///C:/Users/loren/Downloads/Presentazione%20dei%20risultati%20della%20survey%20collaborativa%20rivolta%20ai%20cittadini.pdf

higher 52% would consider self-repair. In the case of high-tech products, 49% would prefer professional services, with only 20% considering repairing the object on their own. When it comes to furniture, 47% would seek professional repair services, and 41% would attempt self-repair. Regarding awareness of repair rights, 70% know that maintenance and repair instructions must be made available together with the purchased item, 60% are aware they have the right to purchase washing machine spare parts, and 32% are aware that manufacturers must provide certain spare parts for large household appliances for at least seven years. As for durability rights, 47% know they have the right to software updates for smartphones and tablets for the first two years after purchase, 31% are aware that sellers and manufacturers are legally required to declare the expected lifespan of smartphones and tablets, and only 19% understand that the conformity guarantee does not ensure a minimum product lifespan. Overall, 60% of respondents report having some knowledge regarding their rights to repairability and durability.

A second research, conducted by Altroconsumo in 2024 through its collaborative platform *AC makers*, interviewed 1,000 consumers on needs of information and training about repairability. Respondents were both men (58%) and women (42%), and mainly aged between 36 and 55 years (52%). Many are the types of products that consumers interviewed would be more inclined to repair or have repaired, mainly household appliances, large household appliances (59%) and small household appliances (36%). Products related to mobility such as bicycles, scooters, cars, etc. are among the more repaired ones (50%) together with electronic and hi-tech devices (49%). Among the reasons for choosing to repair products, the economic one is the most relevant (74%). The attention to the environment is also an important reason for many consumers interviewed (44%). The answers to the question on information that manufacturers must provide concerning the repairability of their products show an interest of consumers interviewed on one's repair skills. In fact, detailed repair manuals (46%) and video tutorial are the type of information and training more asked by consumers interviewed. Internet is the main source of information about repair services (87%). In many cases, interviewed consumers turn to the manufacturing company directly (44%). On the other hand, the lack of skills is the main obstacle in repairing products (58%). There is the need to increase one's repair skills and the wish to repair products the difficulty of finding spare parts (36%) outweighs "too high costs" when it comes to do-it-yourself repairs (31%).

In 2024, a study conducted by project partner DECOP in **Portugal** explored the repair behaviours of Portuguese consumers concerning both hi-tech devices and household appliances. The study, conducted via an online survey between June 20th and July 1st, targeted a sample of the adult Portuguese population, yielding 832 valid responses. These responses were weighted to accurately represent the national population's distribution in terms of gender, age (25-79), educational level, and region. Appliances were

categorized into three main groups: big household appliances, small household appliances, and hi-tech devices. The study revealed significant insights, such as cost being the primary deterrent to repair across all categories, cited by approximately two-thirds of respondents. Additionally, issues like the unavailability of parts for repair posed challenges, especially for big appliances, influencing one-fifth of respondents' decisions. Notably, consumer preferences varied by appliance type, with a higher inclination to repair big household and hi-tech devices compared to small appliances. For big household appliances, the main go to options are brand's technical assistance or independent repairers. For small household appliances, consumers are more willing to do repair on their own (using tutorials and other available info sources). Finally, over 75% of respondents declared to have sent unrepaired appliances to the correct recycling track.

In **Slovenia**, the Slovene Consumers' Association conducted an online survey in 2023[4] with 500 participants, revealing significant consumer scepticism about the feasibility of repairs due to missing information on costs and repair success rates. Most respondents were unwilling to wait long for repairs or spare parts, and many preferred buying new products if there had been notable technological advancements. Approximately half of the participants opted for professional repair services, while only a small portion attempted repairs themselves, alleviating some pressure on service providers. Trust in Slovenian repair services is low, with consumers reporting issues such as being charged for consultations, being directed to self-repair under warranty, incomplete repairs, and refusing services for specific machines. Additionally, 8% of respondents experienced sub-optimal performance after repairs, and 7% faced recurring malfunctions, which may be attributed to inadequate repair skills. Another survey with 400 participants conducted in June 2024 by the same association aimed at investigating consumers' attitudes toward buying second-hand appliances. The survey reveals that 13% of consumers are unwilling to buy used appliances, while 15% are indifferent. Among those open to used items, 78% prefer buying from legal entities in physical stores, 52% are comfortable buying from individuals, and 45% from legal entities online. Some products, like air conditioners (50%) and baby care electronics (42%), are less favoured, while garden tools are the most accepted. Lower prices attract 78% of buyers, with most willing to pay 40-60% of a new item's price.

Warranties and up-to-date technology are important for most, and consumers expect used appliances to last four to six years. Nearly half of respondents have bought used appliances, with mobile phones and computers being the most common. However, complex products like air conditioners face less demand due to handling challenges and lack of guarantees. Consumer rights are better protected when purchasing from legal entities due to stronger legal safeguards.

[4] https://www.zps.si/nasveti-in-vodniki/rezultati-spletne-ankete-ali-slovenci-radi-popravljamo-izdelke-2023-04-05

In **Spain**, project partner OCU, in collaboration with the PROMPT Consortium, carried out a study in 2021 to understand the reasons why consumers in Spain replace appliances such as washing machines, vacuum cleaners, mobile phones, and televisions even when they are still functional or when they break down and are not repaired. PROMPT, an acronym for Premature Obsolescence Multi-stakeholder Product Testing Programme, is a project funded by the EC under the Horizon 2020 research and innovation program. It aims to help extend the lifespan of products and support the transition towards CE. The study was conducted through 48 in-depth interviews.

Results reveal that, while Spanish consumers acknowledge the importance of extending product life for sustainability, their actions do not align with this awareness. Many prefer to replace items rather than invest in repairs. Two main barriers to repairing appliances are identified. The first one is the perceived poor quality of repair services: interviewed consumers often don't know where to get their appliances repaired, and when they do find a place, it seems far away, slow, and of questionable quality. The prices are considered too high, making repair seem not worthwhile. Often, even the repair technicians themselves recommend replacing the appliance with a new one instead of attempting a repair. The second one is the strong inclination towards acquiring the latest technology: the appeal of new products, especially hi-tech ones, often outweighs the incentive to repair old products. The study also revealed significant differences in attitude towards repair across different demographic groups: independent young people are more impulsive and focused on acquiring the latest technology, especially smartphones and smart TVs, with little concern for repairs. Couples aged 25 to 35, with double incomes and no children, tend to delay replacements but indulge in purchases when they find good deals. Families are practical, prioritizing quick repairs for essential appliances, but are selective when buying new ones, often recycling or repurposing old devices. Seniors over 55 are cautious and prefer personal interactions when purchasing or repairing items, and when recycling used products as well. Consumers also suggested that improvements in design and repair services could make repair a more appealing option. Specifically, modular designs for easy component replacement, repairable designs with affordable spare parts, and high-quality repair services are seen as essential for enhancing durability.

Conclusions

The aim of this analysis was to investigate the attitude of citizens in the REPper area towards repair practices and to identify those behaviours that need to be modified in order to make the choice of repair over replacement more and more frequent.

In Section 1, key concepts and principles of behavioural sciences have been discussed. This discipline offers valuable insights into the complex factors influencing human decision-making, including cognitive biases, social norms, and institutional contexts. The integration of behavioural science into policymaking has enabled the design of interventions, such as nudging, that guide individuals toward welfare-enhancing and sustainable choices without restricting their freedom. The behavioral insights outlined here will serve as a foundation for designing and testing nudging strategies, as detailed in D 3.1.2. These insights will also inform the creation of blueprints tailored to each REPPER region, ensuring targeted and effective interventions.

Section 2 has shown how repairing, traditionally understudied by economics, has gained interdisciplinary attention, integrating psychological, anthropological, sociological, and ethical dimensions. Beyond restoring functionality, repair practices involve emotional attachment, redefine values, and challenge consumerism. Repairing has recently received attention from economic science as well, due to the growing interest in the topic of CE. Economic studies focus on the identification of barriers to repair decisions, such as high costs, accessibility, and manufacturer practices, particularly in the electronics sector.

In Section 3, the main results from collected studies on consumers' attitude towards repair have been presented. Both cross-country and single-country researches have been take into account. Several general conclusions can be drawn from these studies. First, while respondents generally demonstrate a good awareness of circular concepts and consider themselves environmentally conscious, their behaviour does not always align with this perception when it comes to repairing products. Additionally, although some studies suggest differences in repair attitudes across various sociodemographic and economic groups, and reveal that repair is more frequent for certain categories of products, common barriers to repair are consistently identified across almost all studies. These barriers are primarily economic ones. For many respondents, the cost of repairing a broken product is still too high to be considered a viable option compared to purchasing a new one. This cost can be understood both in monetary terms — the price of repair services is often seen as too high relative to the cost of buying new products — and in terms of time — the effort involved in finding

reliable repair services, sourcing good-quality replacement parts, or acquiring the necessary repair skills makes the process seem too time-consuming compared to the immediate convenience of buying a new product. Furthermore, there is often a desire to own the latest model, especially when it comes to high-tech products, as well as the perception that choosing to repair rather than buying new items may signal a lower social status. Finally, examined studies generally address consumers' perception towards CE and repair, while it would be really important to investigate producers' and repairers' perception as well.

Based on the insights from Section 3, policies and initiatives aimed at promoting circular behaviours, particularly product repair, should focus on reducing both the actual and perceived costs of repair for consumers, while also associating product repair with social and reputational benefits. The identification of such strategies is indeed the main objective of D 3.1.2 which, starting with an analysis of consumer behaviours and an examination of current policies for the promotion of repair in the REPper area, will formulate recommendations for the design and implementation behavioural strategies for advancing repair in partner countries. These recommendations will be tailored to the specific context of each country involved in the REPper project and will address specific challenges connected to the implementation of the different types of Repair Hubs.

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