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The Pro-Circular Change Model (P-CCM): Proposing a framework facilitating behavioural change towards a Circular Economy



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ABSTRACT

A Circular Economy is an economic and industrial system where resources are kept in use for as long as possible. This system is an alternative to the “take-make-use-dispose” path which is followed in many industries. Businesses can adopt a circular approach to production by implementing a range of alternative business models. These models require consumer acceptance, however a number of behavioural barriers are currently preventing the development and adoption of a Circular Economy. There is little research on behaviour change with specific regard to the Circular Economy. This is due to the concepts’ multidisciplinary scope which makes data collection methods expansive and challenging.

The Pro-Circular Change Model (P-CCM) is a novel theoretical framework, which uses a Theory of Planned Behaviour (TPB), Pro-Circular Values (P-CVs) and Persuasive Communication (PC) to identify and influence behaviours that can support the development of a Circular Economy. For the purpose of the model, behaviours that are brought about due to the prioritising of resource-efficiency were defined as Pro-Circular.

1. Introduction

The linear economy was established in the early days of the industrial revolution and is still prevalent in a significant majority of industries to date. It is based on the “take-make-use-dispose” system, where products are made, used and disposed of at the end of their life. This system can lead to resource overuse, waste and is founded on the naive assumption of an infinite material supply. While its practice is common, governments (European Commission, 2015a; DEFRA, 2015) and businesses are beginning to realise the potential and “importance of moving to a more sustainable economy” (DEFRA, 2015, p. 2).

An alternative to the linear model is a Circular Economy. A Circular Economy is an economic and industrial system where resources are kept in use for as long as possible. In contrast to the linear economy it can eliminate waste, reduce environmental impacts of production and consumption, and provide resource security. It also has the potential to generate more jobs and sustain a competitive and growing economy (European Commission, 2015a).

The concept of a Circular Economy was first initiated by Walter Stahel in the 1970’s. Stahel emphasised the importance of extending the lifecycle of products, as a way to achieve a more sustainable economy.

As shown in his closed-loop framework, this is a result of consistently reusing, repairing, reconditioning and recycling products and components (Stahel, 1982). In the 1990’s, the Circular Economy was again advocated by McDonough and Braungart, who were proponents of the Cradle to Cradle. This approach focuses on closed-loop design and manufacture, however extends Stahel’s concept of the Circular Economy to consider biological products. McDonough and Braungart, divided the Circular Economy into two distinct cycles – for biotic and abiotic products (McDonough and Braungart, 2002). In recent years, the Circular Economy has been advocated by authors such as Pauli (2010) and Thackara (2015). Both, Pauli and Thackara, emphasised the need to shift towards a more sustainable and natural economic system. Since 2010, the concept has been championed by the Ellen MacArthur Foundation, who work with businesses, governments and academia to engage decision makers and leaders in the Circular Economy framework.

Businesses in the abiotic sector can adopt a circular approach to production by implementing a range of alternative business models, such as: product-service systems (PSS), sharing platforms, maintenance and refurbishment or remanufacture (APPSRG and APPMG, 2014). However, many businesses do not have sufficient knowledge of the

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above models to confidently divert away from the current linear-based norm (European Commission, 2014; Rizos et al., 2015). This knowledge gap results in many businesses overlooking the financial benefits and competitive advantages that a Circular Economy can bring (Ellen MacArthur Foundation, 2012). Some businesses may be cautious about how their end-user will respond to changes in their business models, which is also due to a lack of knowledge and familiarity with Circular Economy. For example, products that are remanufactured or refurbished, are often wrongly perceived by the consumer to be of lower quality (APPSRG and APPMG, 2014), when this is not the case. Furthermore, implementation of Pro-Circular Behaviour (P-CB) is often disregarded due to the benefits (e.g. resource security, waste reduction) not being immediately apparent (Atherton, 2015).

There is currently a lack of research on consumer behaviour in regards to the Circular Economy (Ellen MacArthur Foundation, 2013). Data collection on this is still in its infancy due to its challenging (Atherton, 2015) and multi-disciplinary scope. Consequently, organisations such as the World Bank (2014) has called for further research into the influencers of psychological change in resource consumption.

This paper encourages further research into behaviour change by proposing a novel behavioural change model – The Pro-Circular Change Model (P-CCM). This theoretical model identifies a core set of behaviours and values that can identify an individual as being Pro-Circular. The model also shows how to design more effective interventions to encourage and promote Pro-Circular Behaviours in target groups.

2. Pro-Circular Behaviour (P-CB)

Many experts agree (e.g. European Commission, 2015a; DEFRA, 2015; Atherton, 2015; Ellen MacArthur Foundation, 2013), that moving to a Circular Economy requires change to how people produce and consume products. Adoption of circular business models (e.g., remanufacture, maintenance service, product-service-systems) by both producers and consumers, can lead to favourable behaviours and advantageous outcomes (APPSRG, 2014; Ellen MacArthur Foundation 2013). Examples of such corresponding behaviours and outcomes are shown in Table 1.

Literature on the Circular Economy frequently discusses behaviour change (e.g., The CIWM, 2014; The Scottish Government, 2016). However, to date behaviour has not been identified and defined in the Circular Economy domain. To distinguish specific behaviours that support the development of a Circular Economy, authors of this paper propose to define Pro-Circular Behaviour (P-CB) as *an action which is brought about due to prioritising resource-efficiency. This behaviour benefits or at least reduces damage to the environment, economy and society.* In the abiotic Circular Economy system, these behaviours can be reusing, repairing, refurbishing, remanufacturing, recycling and borrowing or leasing products.

The Pro-Circular Behaviour shares some of its characteristics with an existing Pro-Environmental Behaviour. As per definition, the Pro-Environmental Behaviour is a kind of behaviour which “consciously seeks to minimise the negative impact of one’s actions on the natural

Table 1
Pro-Circular Behaviours – parallel examples and shared social, environmental and economic impacts.

Producer offerings	Consumer behaviour	Shared outcomes
Remanufacturing products	Buying remanufactured products	Reduction of waste and air, water and soil pollution; more education, training and job opportunities; innovation and growth of local businesses
Repair and maintenance service	Extending life of owned products	
Product-service platforms	Sharing products	

and built world” (Kollmuss and Agyeman 2002, p. 240). Nonetheless, the Pro-Environmental Behaviour concentrates purely on the environmental impacts of one’s action, omitting the economic and social factors. Pro-Circular Behaviour seeks to adopt these omissions and to include the economic and environmental factors.

Pro-Circular Behaviour is the kind of behaviour the Pro-Circular Change Model aims to engender.

3. The Pro-Circular Change Model (P-CCM)

The Pro-Circular Change Model (P-CCM; Fig. 1) is a conceptual framework that aims to encourage the adoption of Pro-Circular Behaviours. The framework could help to change consumer and organisational behaviours that are not considered beneficial to the development of a Circular Economy.

The framework can be used to campaign for behaviour change within targeted consumer groups that share similar characteristics, values and attitudes. The desired result being a change in the targets unfavourable behaviour towards the purchase, use or even disposal of a product. In this context, an unfavourable behaviour is a kind of action that shortens the lifecycle of a functional product or a component. For example, the demand for new products shortens the lifecycle of potentially repairable or remanufacturable products.

The framework could be used to encourage behaviour in a given industry. For example, in the retail refrigeration industry, manufacturers could use the P-CCM to encourage supermarkets to purchase remanufactured equipment. Similarly, in the computing industry, manufactures could use P-CCM to encourage individual consumers to purchase refurbished equipment. In practice, the P-CMM would be used in marketing communications and materials, such as adverts, emails or presentations. It is important, that the marketing interventions are strategically developed and delivered to target a specific segment of population in order to engage in a behaviour change more effectively (Mckenzie-Mohr, 2000).

A shift in consumer behaviour can be a catalyst for producers and distributors to change their offerings and business models. The framework focuses on how the P-CCM could support the closed-loop production of technical goods, rather than biological goods in the Circular Economy. The P-CCM applicability to the biotic loop requires further investigation.

3.1. How the P-CCM works

The suggested model functions on the basis that an intention to perform a Pro-Circular Behaviour is first identified by those wishing to encourage it and then favourably stimulated to instigate the behaviour change. It contains three key elements (Fig. 1): Behavioural Intention (BI), Pro-Circular Values (P-CVs) and Behaviour Change Intervention (BCI).

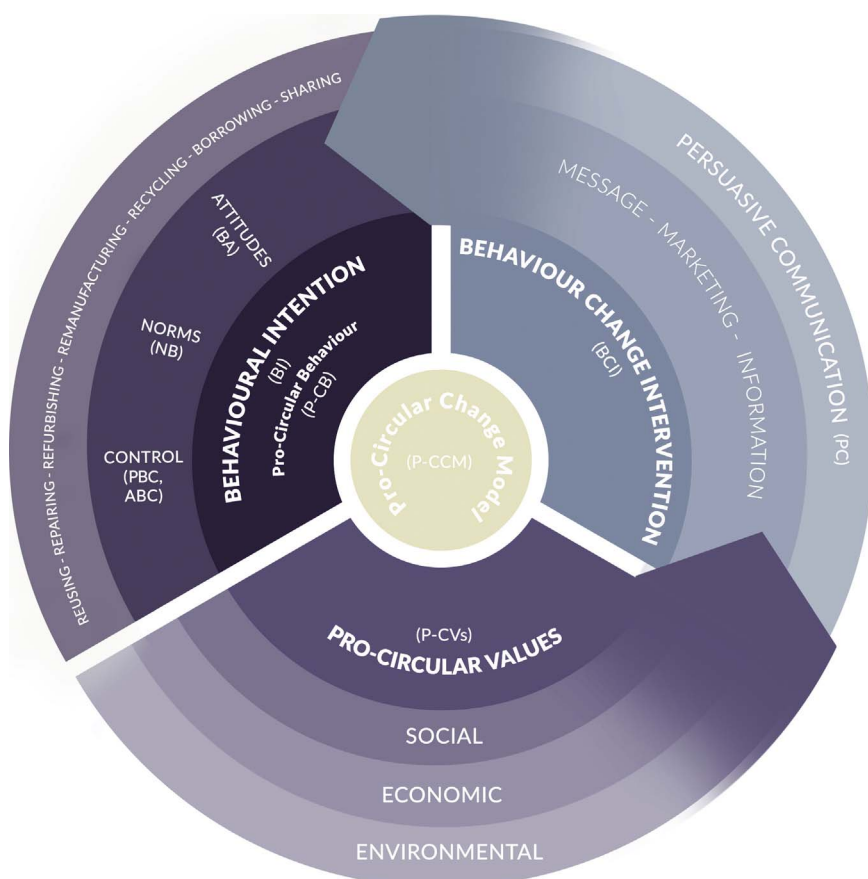
The first construct of the model, the Behavioural Intention (BI) uses the Theory of Planned Behaviour (TPB; Ajzen 1991) to measure a probability of performing a Pro-Circular Behaviour by an individual or a group. The second part of the model, which is the Pro-Circular Values (P-CVs) stage, identifies social, economic and environmental values held by a subject. The last stage of the P-CCM aims to initiate Pro-Circular Behaviours by utilising factors underlying the identified intentions (BI) and values (P-CVs) in the Behaviour Change Interventions (BCI).

The constructs of the P-CCM are explained in Sections 3.3, 3.4 and 3.5.

3.2. Why the P-CCM could be successful in supporting Pro-Circular behaviours

The P-CCM adopts the rules of the well-grounded Theory of Planned Behaviour (TPB). Though, proven to be a reliable predictor of

Fig. 1. The Pro-Circular Change Model (P-CCM).



behaviours when examined across a number of areas, such as: health, purchasing, consumption or sustainability, the theory (TPB) has never been utilised in the context of Circular Economy specifically. However, because some Pro-Circular Behaviours can relate to health, purchasing, consumption or sustainability, the assumptions are that the theory (TPB) could also be used to predict similar kind of behaviours akin to Circular Economy. The theory (TPB) was previously applied to assess intentions to perform pro-environmental behaviours, such as saving energy (Greaves et al., 2013), buying sustainable products (Joshi and Rahman, 2015) and recycling waste (Tonglet et al., 2004).

There are a number of behaviour change theories that are currently referenced in the pro-environmental domain such as Value-Belief-Norm or Theory of Reasoned Action. However neither of these theories specifically address Pro-Circular Behaviours. The Theory of Planned Behaviour has a wider range of variances than the Value-Belief-Norm theory (which focuses on the impact of moral components on a behaviour), and it has shown to be considerably more reliable when assessing recycling (Aguilar-Luzón et al., 2012; Kaiser et al., 2005). The inclusion of the perceptions of the behavioural control (PBC) and consideration of the actual behavioural control (ABC) in the Theory of Planned Behaviour makes the method a stronger predictor of behaviours than the Theory of Reasoned Action, which does not consider these variables (Madden et al., 1992). Specifically in context of the Behavioural Intention (BI) to reuse, repair, refurbish, remanufacture, recycle and borrow or lease products, a perception of behavioural control (PBC) and the ability to perform an action (ABC) can have a significant impact on the conduct of such Pro-Circular Behaviours.

Moreover, research shows that the appropriate interventions can change the variables of TPB and ultimately generate a positive shift in intentions and behaviour (Fife-Schaw et al., 2007). This model supports the design of more effective interventions, by using tailored Persuasive Communication (PC) to target specific groups of consumers or business

to business customers who share similar attitudes, beliefs and perceptions towards certain Pro-Circular Behaviours. PC can be embedded in both verbal and written communications. This type of intervention is commonly used alongside with TPB. Persuasive attitudinal, normative and control messages can influence a Behavioural Intention (BI) of an individual or a group and ultimately impact their behaviour.

Theorists argue that values are considered to have a significant impact on attitudes (Stern et al., 1999) and can explain certain behaviours (Ajzen, 2012). For example, in the existing model of Environmental Concern (Stern et al., 1995) values are defined as one of the key influencers of Pro-Environmental Behaviours. The environmental, as well as social and economic concerns are the three key Pro-Circular Values (P-CVs) which the P-CCM aims to identify and utilise in Behaviour Change Interventions (BCIs) to increase the effectiveness of persuasion. It is possible that this form of intervention could also enhance P-CVs held by an individual or a group.

3.3. Behavioural Intention (BI) to perform a Pro-Circular Behaviour

According to the Theory of Planned Behaviour (TPB; Fig. 2; Ajzen, 1991), human behaviour is first initiated by and relies on the strength of a Behavioural Intention (BI). The intention to perform a behaviour (BI) is a result of beliefs about the outcomes of a behaviour (Behavioural Attitudes; BA), beliefs about the expectations of others (Subjective Norms; SN) and beliefs about the presence of factors that enable a behaviour (Perceived Behavioural Control; PBC). The more favourable Behavioural Attitude (BA), Subjective Norm (SN) and Perceived Behavioural Control (PBC) are, the stronger one's Behavioural Intention (BI. Fig. 3) is. (Ajzen, 1991)

3.3.1. Behavioural Attitude (BA)

Attitude is generally defined as “a psychological tendency that is

Fig. 2. The Theory of Planned Behaviour (Ajzen, 1991).

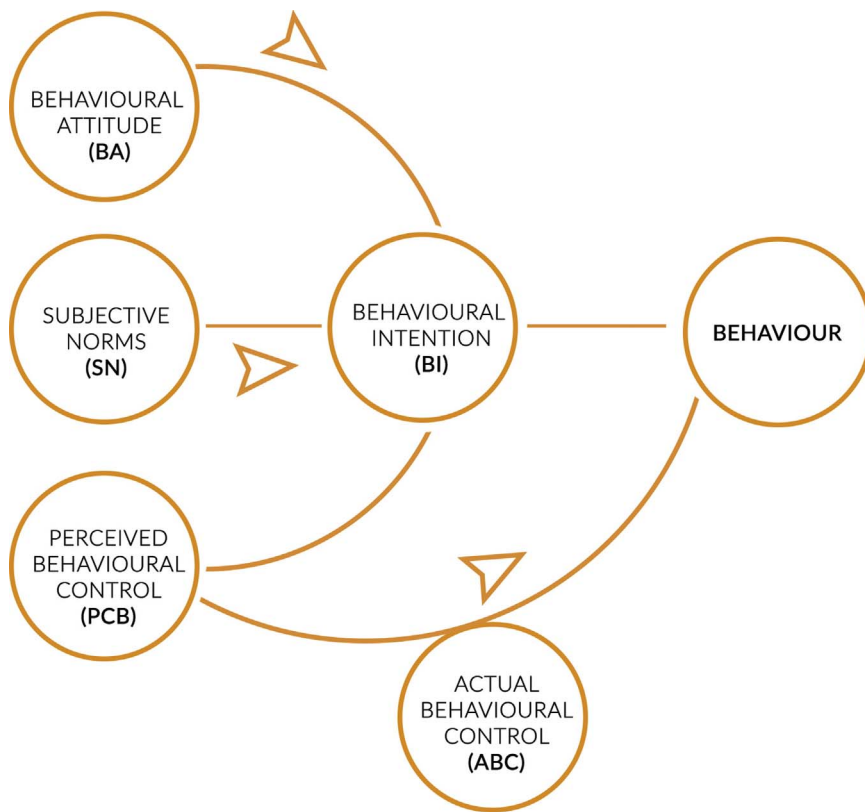
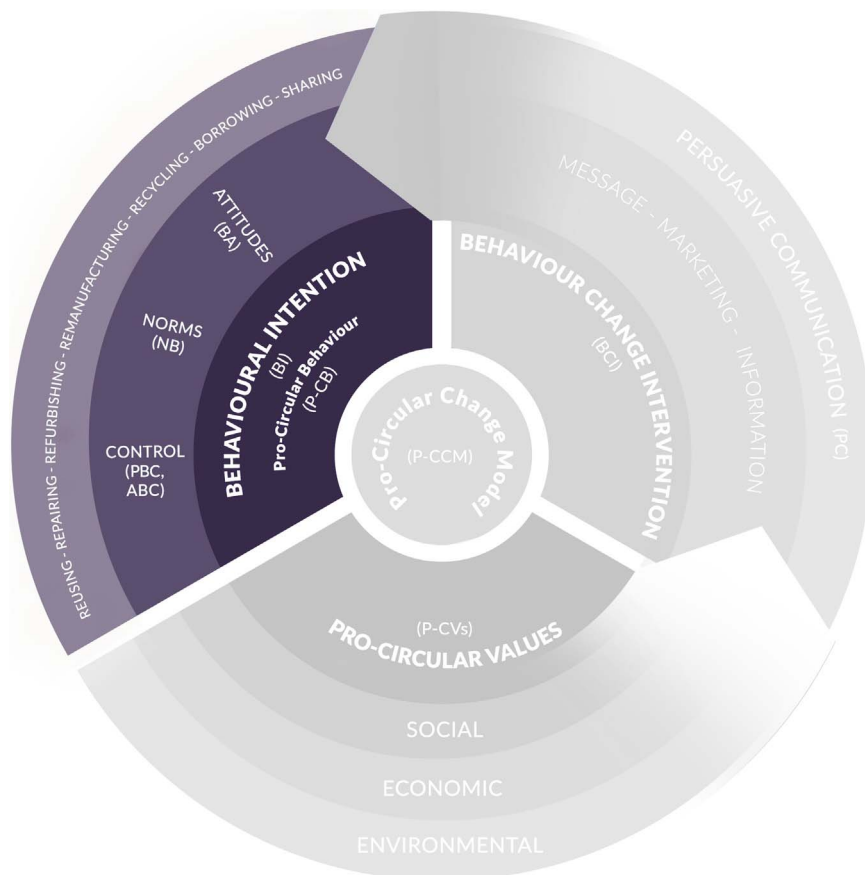


Fig. 3. The P-CCM – Behavioural Intention (BI) Stage.



expressed by evaluating a particular entity with some degree of favour or disfavour” (Eagly and Chaiken, 1993, p.1). Attitudes are considered to have an influence on human behaviour. It is usual for a person who holds positive attitudes towards a certain behaviour to perform the behaviour, and conversely, for a person who holds negative attitudes towards a certain behaviour not to perform it (Ajzen and Fishbein, 1977).

Similarly, attitudes can have favourable and unfavourable effects on Pro-Circular Behaviours. For example, if a person holds unfavourable attitudes towards buying remanufactured products, such as for example: it is very expensive, foolish and harmful in their opinion to do so, it is unlikely that they would proceed with the purchase. Understanding what are the Behavioural Attitudes (BA; of an individual or a group) towards certain Pro-Circular Behaviours is very important to help predict those behaviours and form interventions.

3.3.2. Subjective Norms (SN)

Subjective Norms (SN) are the perceived social pressures to perform or not to perform certain behaviours. They are what a person believes their “important others” (e.g. family member, friend, boss) would think (either approve or disapprove) of them performing the behaviour (Ajzen, 1991). Ajzen (2006) divides the SN into two categories of Normative Beliefs (NB), which are: injunctive and descriptive. Injunctive beliefs are one’s motivation to comply with the “important others”, whereas, descriptive beliefs refer to one’s level of identification with a certain individual or group (Ajzen, 2006).

Both injunctive and descriptive SN could have a positive or a negative impact on an intention to perform a Pro-Circular Behaviour. For example, if a person’s injunctive Normative Belief (NB) is that buying remanufactured products (P-CB) is something their “important others”, (i.e. boss), wants them to do, it is possible that because of this they may proceed with the purchase. Similarly, if a person holds a belief, that buying remanufactured products is a norm because it is something that their “important others” (i.e. friends) do, it is possible that this could also increase their intention to purchase (descriptive NB). Pro-Circular Behaviours need to become “the norm” (RWM Ambassadors, 2014) and identifying what people perceive the behavioural norms (SN) to be in the context of a Circular Economy, would help to design the appropriate interventions that could reshape their beliefs.

3.3.3. Perceived Behavioural Control (PBC)

Perceived Behavioural Control (PBC) is the third construct of the Theory of Planned Behaviour (TPB). It specifies how easy or difficult people perceive it is to perform certain behaviours. Generally, factors such as the availability of resources or opportunities, should increase the likelihood of one’s behavioural achievement. However, the presence of these factors alone does not always influence one’s action, it is their perception towards the control (PBC) that has a strong influence on their actions (Ajzen, 1991).

Similarly, in context of Pro-Circular Behaviours, the PBC can have a favourable or unfavourable impact on one’s action. For example, if a person believes that they are able to buy a remanufactured product because that product is available in the shop, it is likely that this will impact their intention to purchase it.

The PBC can have a direct impact on a behaviour, especially in instances where one’s action relies on the availability of resources or opportunities. For example, if a person believes they are not able to buy the remanufactured product they want, because it is not available to them (e.g. is not produced), they will not proceed with the purchase. This example shows that despite any favourable attitudes, normative beliefs or intentions the person may hold towards the performing the behaviour, they will be unable to perform it. Therefore, it is crucial to identify people’s control beliefs to form suitable resources and opportunities that would allow them to perform the Pro-Circular Behaviours. These could help to form interventions, aimed at changing the control perceptions by communicating the appropriate behaviour enablers (e.g.

tools, opportunities) that are available to them.

3.3.4. Behavioural Intention (BI)

According the Theory of Planned Behaviour (TPB), a behaviour relies mutually on one’s ability (an actual behavioural control) and Behavioural Intention (BI) to perform it. The strength of BI is a result of the attitudinal (BA), normative (SN) and control (PBC) beliefs they hold. The stronger the BI, the more likely is the performing of the behaviour. Therefore, the BI is considered to have a direct impact on a behaviour. (Ajzen, 2006)

This principle also applies to performing of the Pro-Circular Behaviours. For example, if a person’s intention to buy a remanufactured product is low, because they hold unfavourable attitudinal, normative and control beliefs towards it, it is likely that they will not proceed with the purchase. The TPB applied in the P-CCM could help to measure the probability levels of performing the Pro-Circular Behaviours.

3.3.5. Theory of Planned Behaviour (TPB) – research methods

Human behaviour can be identified through the appropriate survey research. The Theory of Planned Behaviour (TPB) Questionnaire (Ajzen, 2006) is a method commonly used to assess behavioural constructs and evaluate the intention to perform a behaviour. The questionnaire can determine the strength of a Behavioural Intention (BI) and its impact on behaviour. Furthermore, by evaluating the attitudinal, normative and control beliefs, this method provides and insight to cognitive foundations of behaviours (Ajzen, 2006).

It is therefore possible, that TPB Questionnaire could also help to determine the intention strength towards performing of a Pro-Circular Behaviour and enable those who want to change behaviours, to evaluate the attitudinal, normative and control beliefs towards it. This knowledge could be used to explain certain behaviours and help form interventions.

3.3.5.1. Defining Behaviours. TACT elements [Target (at which action is directed), Action, Context (in which action is performed) and Time (at which action is performed)] are used to define behaviours measured through the TPB Questionnaire. Setting the same TACTs in the constructs of Behavioural Attitudes (BA), Subjective Norm (SN) and Perceived Behavioural Control (PBC) is important to ensure their compatibility. (Ajzen, 2002)

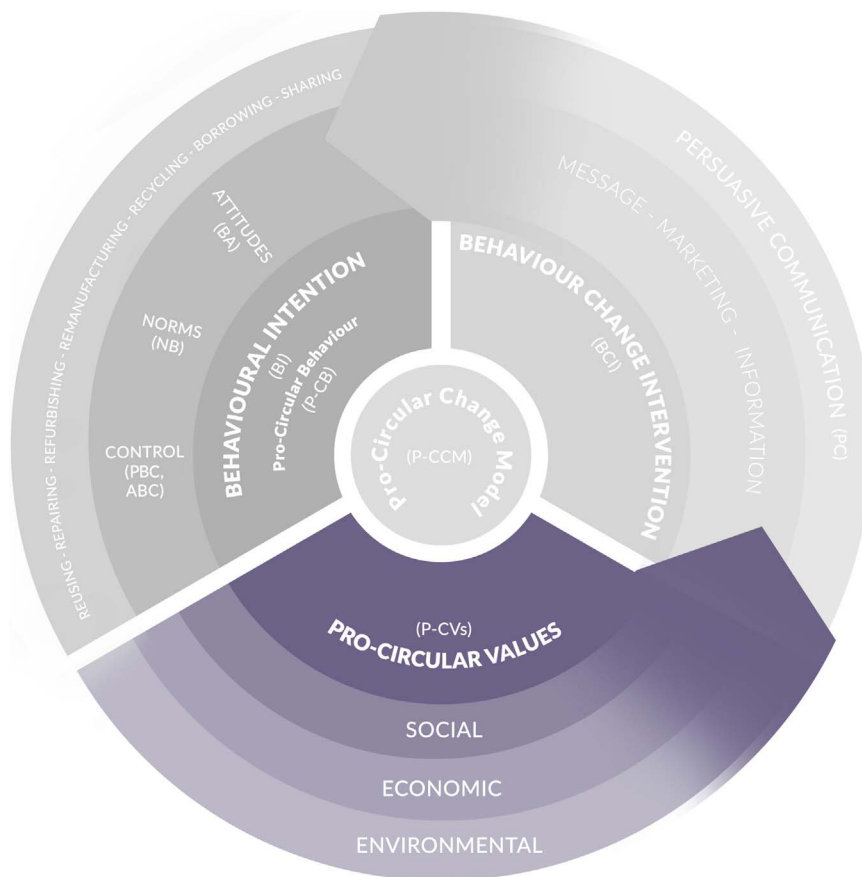
In line with this rule, Pro-Circular Behaviours need to be specified in accordance with TACT across all of the constructs of the TPB to ensure the compatibility. For example, an attitudinal statement related to a Pro-Circular Behaviour, such as buying remanufactured products, can be defined as: “Buying a remanufactured computer for work next week, would be good/bad.” The Target element here is a remanufactured computer, Action is buying, Context – work and Time – next week. Similar TACT constructs need to be applied to its corresponding normative and control questions.

3.4. Pro-Circular Values (P-CVs)

Values differ from individual to individual. They convey what is important to people in their life and are considered as a motivational construct of behaviour (Bardi and Schwartz, 2003). Amongst attitudes, beliefs and behaviours, values can be important influencers of behaviour (Stern et al., 1999; Bardi and Schwartz, 2003), especially when it comes to change on a large scale (Atherton, 2015). Assessing values may help to underline the attitudes towards general targets such as freedom, equality (Ajzen, 2012) and environmental protection (Crompton and McMahon, 2011). Therefore, understanding one’s value towards a greater good in the socio-economic and environmental domain, could help to explain or impact their Pro-Circular Behaviours.

The Pro-Circular Values (P-CVs; Fig. 4) are a set of values that rate social, economic and environmental matters as important to oneself.

Fig. 4. The P-CCM – Pro-Circular Values (P-CVs) Stage.



Generally, values can reflect intrinsic and extrinsic goals. Intrinsic values are associated with concerns about bigger-than-self issues (Chilton et al., 2012). They result in a greater motivation to act in line with the community or environment. Whereas, extrinsic values relate to power, wealth or social recognition (Crompton and McMahon, 2011). Matters related to Circular Economy are considered to be of “bigger-than-self” importance, meaning that P-CVs are inherently intrinsic.

3.4.1. Values – research methods

Human values can be identified by quantitative survey research (Schwartz, 2012; Inglehart, 1997). The assumptions are that the appropriate survey instruments used in the P-CCM could help to determine levels of Pro-Circular Values (P-CVs) one holds. In line with Inglehart’s (1997) method, the intrinsic values can be measured by evaluating people’s responses to questions about the “bigger-than-self” goals, such as global goals they may hold, rather than their individual goals.

In addition, a number of studies suggest using Likert (1932) type point scales in surveys, that can allow participants to express their values. These types of scales could be sufficient to measure the level of importance participants perceive the society, economy and environment have to them. The knowledge gained from these type of surveys, could be used to explain certain behaviours and help form more effective interventions in the last stage of the P-CCM – the Behaviour Change Intervention (BCIs).

3.5. Behaviour Change Interventions (BCIs)

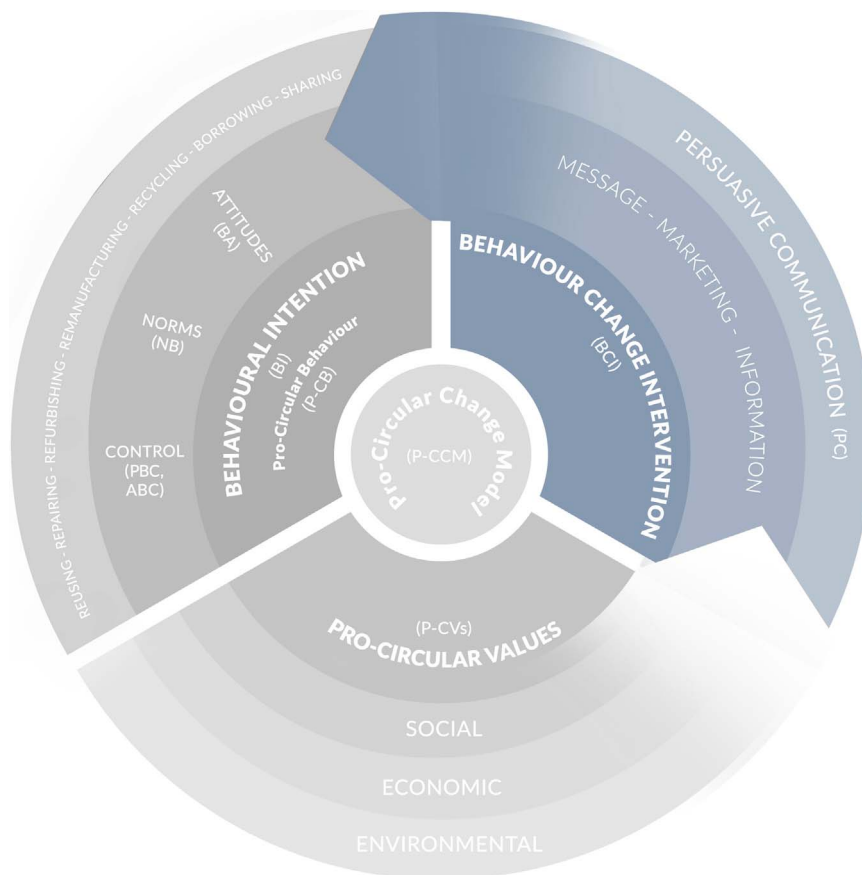
Behaviour Change Interventions (BCIs; Fig. 5) are methods used to change human behaviours. In the P-CCM, BCIs aim to instigate Pro-Circular Behaviours by targeting the constructs of the Behavioural Intention (BI) and the Pro-Circular Values (P-CVs). The interventions

related to the BI aim to shift any of the attitudinal, normative or control beliefs, that may prevent the performance of a behaviour. The model proposes that to increase the effectiveness of targeting those beliefs (TPB constructs), the interventions should be designed by utilising the established P-CVs held by an individual. It is also possible that the interventions could change one’s P-CVs.

Persuasive Communication (PC) is a type of BCI described as a “message that is intended to shape, reinforce, or change the responses of another or others” (Miller, 1980, p. 11). It has the ability to influence people’s beliefs, values, attitudes and behaviours (Burgoon et al., 1994; The World Bank, 2009). Persuasive messages used in the P-CCM aim to convince the reader (or listener) to change their Behavioural Attitudes (BA), Subjective Norms (SN) or Perceived Behavioural Control (PCB), in an attempt to encourage more Pro-Circular Behaviours. It is also assumed that a persuasion which implements either intrinsic and extrinsic values (depending on an individual), could be influential in motivating a person to perform a Pro-Circular Behaviour.

A number of Circular Economy business models, initiatives and product ideas have developed over recent years. These however still remain niche and require mass adoption (European Commission, 2015b) in order to fully support the development of a Circular Economy. It is possible, that these models and ideas are not widely advertised to people or if advertised, they may not be communicated appropriately to achieve the mass adoption of the Pro-Circular Behaviours. As mentioned by Ridley (Gould, 2016) it is now necessary to find the means to advertise the Circular Economy in order to shift people’s behaviours. The persuasive communication is already present in some successful marketing strategies used to change people’s behaviours (O’Shaughnessy and O’Shaughnessy, 2003). It is therefore possible, that the P-CCM could enable the adaptation of Pro-Circular Behaviours through the appropriately tailored message-based interventions.

Fig. 5. The P-CCM – Behaviour Change Interventions (BCI) Stage.



3.5.1. Using attitudinal, normative and control beliefs to influence Pro-Circular Behaviours

When using the Theory of Planned Behaviour (TPB) as a theoretical framework, interventions that target one’s attitudinal, normative and control beliefs, could motivate them to perform a behaviour. A successful intervention could encourage a person’s positive attitude. In case of one’s normative beliefs, this could be based on the perception that their “important others” would approve of them performing a behaviour or that they would too perform the same behaviour (Steinmetz et al., 2016)

The effects of Persuasive Communication (PC) messages on people’s attitudes and normative beliefs were tested in the past and have proven to influence the intention (BI) to perform a behaviour (Ajzen, 1971). Therefore, the assumptions are that either the attitudinal, normative or control PC messages could also shift the intention to perform the Pro-Circular Behaviours. For example, if a person holds a positive normative belief (SN) and a favourable perception of the behavioural control (PBC), yet they refuse to buy a remanufactured product because their attitude (BA) towards buying the product is negative, it is possible that exposing them to the attitudinal PC, could change their attitudes and effectively increase their behavioural intention (BI).

3.5.2. Using Pro-Circular Values (P-CVs) in Behaviour Change Interventions (BCIs)

The Behaviour Change Interventions (BCIs) in the P-CCM are built on individual differences – values. People’s values towards a greater good in the socio-economic and environmental context could influence their Pro-Circular Behaviours.

Due to Pro-Circular Values (P-CVs) being considered as predominantly intrinsic, it is possible that people who hold such values are more likely to perform the Pro-Circular Behaviour. However, the P-CCM identifies the types of the P-CVs (Table 2; intrinsic or extrinsic; social, economic or environmental) of an individual or a specific group

Table 2

Pro-Circular Values (P-VCs) – Social, economic and environmental values in intrinsic and extrinsic motivational context (examples based on an organisational purchasing behaviour).

Values	Intrinsic	Extrinsic
Social	Nation’s health and well-being	Championing Company’s Social Responsibility Initiative
Economic	National economic growth	Saving money
Environmental	Clean and sustainable living environment	Meeting Company’s Carbon Footprint Targets

to use them as behavioural motivators in the Persuasive Communication (PC) messages. Holding intrinsic values alone may not be sufficient enough to influence one’s behaviour towards the “bigger-than-self” goals (Webster and Riddell, 2006). Therefore, targeting values that are extrinsic, could be an alternative route to motivating Pro-Circular Behaviours (Table 2). For example, an individual who decides to buy a locally remanufactured product because they rate national economic growth as very important (intrinsic value), may have the same impact on the economy, as an individual who buys the same product, but is driven by saving money (extrinsic value). The influence of both, intrinsic and extrinsic values on Pro-Circular Behaviours in different target groups needs further investigation.

4. Testing of the P-CCM

The proposed model aims to encourage further research into the existing behaviour change theories, particularly the Theory of Planned Behaviour (TPB), Persuasive Communication (PC) and human values across the various behavioural domains of a Circular Economy.

The model is currently being assessed in a study within the retail refrigeration industry. All participants in the study purchase

refrigeration equipment for their businesses. The study aims to positively impact their behaviour and encourage them to purchase a re-manufactured equivalent.

Participants intentions prior to interventions are measured using a TPB Questionnaire. The questionnaire is followed by series of persuasive (PC) messages that integrate Pro-Circular Values (P-CVs). The influence of the PC on the Behavioural Intention (BI) to buy a re-manufactured product is measured initially through an analysis of the results in the survey.

Results from the survey are used to develop a strategic marketing intervention plan. The plan will use the most effective PC messages drawn from the survey results. For example, in a scenario where an attitudinal message that combines extrinsic economic P-CVs is declared by the majority of participants to have the highest impact on their BI, this type of message would be utilised further.

As a result of the participants' exposure to the intervention, (PC messages in survey and marketing campaign) their future behaviour is monitored, through a log of any enquiries and/or purchases of re-manufactured products. A further TPB Questionnaire will also be distributed to reassess the impact of the strategic marketing plan on the target group.

5. Limitations

Research suggests that Persuasive Communication (PC) combined with the Theory of Planned Behaviour (TPB) can instigate behaviour change (Ajzen, 2002). Where possible, it is recommended that after being exposed to the intervention, all participants are given the same questionnaire to reassess their behavioural intention. This reassessment is dependents on the participants' availability and willingness to engage, which can be an obstacle to receiving a complete set of results. In addition, depending on the time lag between the first survey and the second survey, the participate is subject to a range of externalities (such as news, stress, policies etc.) which can impact (positively or negatively) the extent or nature of behaviour change.

6. Conclusions

Testing of the P-CCM is now in progress but due to it being a longitudinal study, no results have been obtained yet. However, based on the previous research on Theory of Planned Behaviour (TPB), Persuasive Communication (PC) and human values, the hypothesis is that these constructs, when combined together into a framework, could identify, change and maintain the Pro-Circular Behaviours. The analysis of the results will initially test this hypothesis, initiate change and further the development of the model (if necessary).

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