Show me your mobile and I will tell you who you are: Forecasting consumer compassion and altruism behaviour through smartphone type and usage.

Abstract

Smartphones, as an integral part of human life, can now assist researchers in forecasting human behaviour patterns. Recently, the spread of COVID-19 increased people's reliance on their smartphones, and the resulting lockdown revealed them engaging in a variety of pro-social or virtue-based behaviours. Using the extended self-theory, previous research examined the effects of objects on the human mind and cognitive behaviour in order to identify behavioural segments in smartphone markets. Subsequently, scholars examined smartphone-based (iPhone vs. Android) virtue traits such as honesty and humility. However, other virtues such as compassion and altruism have received little attention in this regard. Thus, this study aims to bridge this gap by analysing the predictability of consumers' compassion and altruism in relation to their smartphone type (iPhone vs Android) and usage. A total of 509 completed questionnaires were received from participants in the United States, Europe, and Asia. According to the findings, iPhone users are more compassionate and altruistic than Android users. This study offers implications for marketers, retailers, and brands in developing strategies based on smartphone user behaviour.

Keywords: COVID 19; retail consumers; compassion; altruism; smartphone usage; ethical human behaviour

1. Introduction

The COVID-19 pandemic has created a wide variety of challenges and fears throughout the world, and as an unprecedented situation, it has also elicited massive demonstrations of pro-social behaviour (Kappes et al., 2018) Covid crisis showcased many virtues and altruistic behaviour by people either physically putting being present to help people or use technology and social media tools to facilitate help. Additionally, because of the pandemic's lack of in-person connection, individuals grew increasingly reliant on technology than ever before (Zhang, 2020). As technology's role in global societies becomes more tangible, so do our relationships with the numerous devices we use daily. In this quest, 'smartphones' are one such technology-enabled device that has infiltrated the personal space of billions of people worldwide (Lachmann et al., 2018). In other words, technology not only serves as a way of forming social relations that influence emotional states such as isolation, depression, self-esteem, and social benefit for humans (Park and Lee, 2012); it also becomes so embedded in people's lives it would be the first thing they look at in the morning and the last thing they look at before going to bed (Lee et al., 2014).Therefore, a smartphone is more than just a communication device; it also serves as a social agent in people's lives as digital companion (Carolus et al., 2019; Ameen et al., 2020). This promotes social connectedness, which influences people's behavioural patterns (Konsolakis et al., 2018).

The greater use of smartphones among people has drawn attention to the study of human behaviours associated with them (Yan et al., 2019), and more pertinently, researchers have investigated individuals' personality, psychological, and economic behaviour (Lee et al., 2014; Shaw et al., 2016; Gotz et al., 2017; Lee and Lee, 2018). Utilizing extended self-theory (Belk, 1988), studies have been conducted on forecasting behavioural patterns to gain a better understanding of individuals' personality and demographic characteristics as a result of their smartphone preference. (e.g. Chittaranjan et al., 2013; De Montjoye et al., 2013; Manstead,

2018; Schoedel et al., 2018). Scholars, for example, have attempted to investigate the role of honesty, humility, personality characteristics such as emotional stability and openness, and so on, relying on smartphone operating systems (Shaw et al., 2016; Stachl et al., 2017; Konsolakis et al., 2018; Ellis et al., 2019).

While these observations provide retailers and psychologists with valuable insight into human behaviour, particularly in social contexts, there is a gap in predicting interpersonal prosocial behaviour such as compassion and altruism based on smartphone ownership and consumption. Compassion and altruism (willingness to assist) are powerful social, personal, and organizational characteristics that are argued as moral characteristics in a multitude of cultures, religions, and countries (Snyder and Lopez, 2009; Seligman and Csikszentmihalyi, 2000; Nickell, 1998). Following the COVID 19 global health crisis, the value of these characteristics has increased further in society and organizations, as shared risk can serve as a catalyst for a shared intention of compassion and loving-kindness (Chávez-Segura, 2020; Carnevale and Hatak, 2020).

Despite these benefits, fostering these behaviours among today's digitally connected people continues to be a challenge (Lemire, 2019; Weng et al., 2013; Wiljer et al., 2019; Lord, 2017). According to research, smartphone use may erode moral values (such as altruism), diminish empathy and compassion, and reduce an individual's willingness to assist others (Banjo, et al., 2008; Tellier, 2013; Manney, 2015; Akbari, 2018). Additionally, since self not only could extend to possessions, but it also then influences behaviour surrounding possessions, such as buying, selling, caring for and discarding as well as maintaining behaviour (Cushing, 2011), the behaviour and personality characteristics of users are critical when developing new products and services that attracts and retains users. In this context, we believe while these observations can provide retailers and psychologists with valuable insights into human behaviour, particularly in social contexts, there is a gap in predicting interpersonal behaviour,

such as altruism and compassion which help societies to face COVID crisis, based on smartphone ownership and consumption.

As a result of the growth and attachment for smartphones, particularly during the pandemic and lockdown, this study aims to empirically fill the gap in the literature by examining whether a particular type of smartphone operating system can reveal information about individual altruism and compassion behaviour without considering the smartphone as an entity in the study. Android accounted for 86.6% of the smartphone operating system market in 2019, while Apple iOS accounted for 13.4%. (IDC, 2020). While Android and iOS are the most popular smartphone operating systems in the world, their interfaces and value propositions are quite different. For instance, a typical Android user is assumed to be male and technically savvy, whereas women are more likely to own an iPhone. Additionally, iPhone users are said to be more devoted to Apple, purchasing rather more apps and engaging more openly with their phones than Android users (Reinfelder et al. 2014). Thus, this study will concentrate on these two distinct subgroups of prominent smartphone users.

While attempting to fill this void, this study makes several theoretical contributions and has implications for practice. In terms of theoretical contributions, the research fills the gap in the current literature by exploring the differences in compassion and altruism among various smartphone users. The findings of this study will advance the previously established research on the personality characteristics of smartphone users (e.g Schejter et al., 2010; Chua et al., 2011; Lee et al., 2018). Additionally, this study sheds light on how to assess and improve compassion and altruism among various members of society. Finally, the study's findings may aid retailers and brand strategists in marketing their products. The paper is structured as follows: after this introduction, the following section will outline the literature review and theoretical context. The research design is then presented, followed by the findings. Finally, the paper discusses limitations and future directions.

2. Literature review

2.1 The concepts of compassion and altruism

"What we need more than anything is to develop an attitude of altruism and to create a compassionate world" (Dalai Lama, 2007; 2019)

Compassion is a social relationship as well as a social engagement with others (Seppala et al., 2017; Simpson et al., 2020). It is defined as a comprehensive understanding of another person's problem or distress, with a commitment to resolving the problem or alleviating the suffering. Additionally, compassion exemplifies a caring response to suffering that acknowledges the human condition as a shared one (Seppala et al., 2013; Weng et al., 2013; Neff and Seppala, 2016). Compassionate individuals foster greater cooperation/coordination among people (Eldor and Shoshani, 2016; Baston, 2011; Park et al., 2017) and contribute to societies' success (Weng et al., 2013). Additionally, compassionate people are effective at assisting organization members in coping with such pain (Shahzad and Muller, 2016).

On the other hand, altruism is one of the most widely studied interpersonal behaviours since it has direct implications for business profitability and is a good indicator of employee productivity (Batson et al., 2011). Altruism is determined by a person's influence on others, regardless of the outcome (Furnham et al., 2016). It has been shown altruistic behaviours are triggered by empathic emotions such as sympathy and compassion (Lu and McKeown, 2018). According to the empathy-altruism hypothesis, true altruists are motivated to help without any expectation of internal or external gain (Batson and Shaw, 1991; DeSteno, 2015). Although it is still debated whether some people are born with a natural proclivity to help others while others are not, one theory suggests that altruism is usually defined by genetics (Klimecki et al. 2014).

From a social standpoint, altruistic behaviour and compassion have a significant impact on the success of social groups (Weng et al., 2013; Darwin, 2004; Fehr and Fischbacher, 2003) by fostering cooperation, allowing better decisions, and building a sustainable society (Purc

and Laguna, 2019; Anderson, 2017). Similarly, compassion fosters social connection (Seppala et al., 2013) and provides social support to help people cope with stress (Cosley et al., 2010).

From individual standpoint, based on previous findings, practising compassion and altruism behaviour is beneficial to individuals because it reduces stress, increases contentment decreases depression, improves mental and physical well-being, and fosters stronger cooperation/coordination among people (Shapira and Mongrain, 2010; Eldor and Shoshani, 2016; Baston and Ahmad, 2001; Batson et al., 2011; Park et al. 2017). Moreover, compassion boosts positive emotions (e.g., gratitude), decreases anxiety (Lilius et al., 2008), and reinforces the motivation and loyalty of the person suffering to the organisation (Grant et al., 2008, Lilius et al., 2008), whereas altruism has a positive impact on one's own well-being and relationships with others (Irani, 2018).

From organization standpoint, altruism has a significant effect on a business's bottom line and is an important predictor of organizational performance (Batson et al., 2011). Altruism provides an excellent foundation for comprehending consumer motivations (Hopkins and Powers, 2009). It can motivate employees and organizations to make charitable donations, and it can help organizations improve their reputation and foresee marketing benefits from altruistic behaviours (Lähdesmäki and Takala, 2012). Organizational studies (e.g., Hur et al., 2018) have demonstrated the value of compassion and altruistic behaviour, as employees who exhibit compassion and altruism report positive feelings at work. These emotions are associated with a variety of critical organizational outcomes (Chu, 2016).

Previous research shows that promoting altruism in organisations increases trust among co-workers (Guinot et al., 2016), organisational effectiveness, and managers with altruistic behaviours can drive social responsibility in organisations (Furnham et al., 2016). It has been asserted that a supervisor's compassion improves worker performance (Wang et al., 2018). Consequently, in the context of health, compassion among patients and nurses is important in achieving important care outcomes (Van der Cingel, 2011), among education setting as it

results in increased teacher job satisfaction, organisational commitment, and a sense of emotional vigour (Eldor and Shoshani, 2016). Altruism can motivate employees and organisations to make philanthropic decisions, and it can help organisations improve their reputation and foresee marketing benefits (Lähdesmäki and Takala, 2012).

2.2 Covid-19 and the importance of compassion and altruism

Compassion and altruism (willingness to help) are effective social, personal, and organisational characteristics that are debated as moral traits in many cultures, religions, and counties (Snyder and Lopez, 2009; Seligman and Csikszentmihalyi, 2000; Nickell, 1998). After the COVID 19 global health crisis, the value of these traits in society and organisations has grown even more, as a shared risk can become a catalyst for a shared intention of compassion and loving-kindness (Chávez-Segura, 2020; Carnevale and Hatak, 2020). According to practitioners, Covid-19 as an uncertain situation has created a broad range of challenges that give rise to displaying some pro-social behaviour (Kappes et al., 2018) such as compassion and altruism among people. For instance, individuals exemplified many altruistic behaviours, such as shopping support, dog walking assistance, and volunteer work in hospitals, and firms with altruistic behaviours emerged stronger from the COVID-19 crisis (Getz and Marbacher, 2020). Also, for instance in the workplace, managers' compassion, for example, was seen in providing more flexibility in working hours and asking more about their friends and families (Jackson, 2020). According to Baily and West (2020), by working compassionately, courageously, and honestly during the COVID 19 crisis, leaders can support and care for their staff, allowing them to save thousands of lives across communities.

2.3 Smartphone and their presence in our life

Smartphones have become an inseparable part of people's lives due to their ability to do much more than listening. They can assist individuals in completing a variety of tasks, for

example shopping, making payments, texting, sending videos, and taking photos (Ameen et al., 2021). Previous studies highlighted the role of smartphones in improving livelihoods and social life. Wang (2017) explained that smartphones can be taken as social actors rather than just tools and they can help in overcoming some difficulties such as loneliness. Additionally, when people are exposed to a stressful situation, a smartphone can be the "first-aid-in-the-pocket" (Schneider et al., 2018). Furthermore, smartphones were found to increase productivity in daily life, extend social networks, allowing the connection with several types of people and brands (Rhiu and Yun, 2018). Lapierre and Zhao (2021) explained that person-to-person smartphone use was associated with greater belonging support (i.e., feeling accepted by people around you) and tangible support (i.e., feeling that you can find people to help with practical needs) over time. From the retailers' perspective, individual's use of smartphones allows them to be connected to brands and it provides these brands a wealth of data that can be used for a better understanding of customers' behaviour (Alnawas and Aburub, 2016). In addition, some studies found that certain smartphone attributes can affect the digital customer experience which can impact retailers (McLean et al., 2018). On the other hand, retailers are experimenting with new ways to connect with consumers, even more so now that consumers can access all information via their mobile phones. This requires a thorough understanding of critical consumer characteristics such as demographics, behaviour, and so forth. According to Wagner (2011), retailers who fully comprehend their customers' mobile channel behaviour have the power to change the shopping experience. As a result of this study, retailers can gain a deeper understanding of virtue behaviour, which may facilitate them in determining the shopping preferences of compassionate and altruistic individuals based on their smartphone usage, such as product preference, frequency of purchase, and so on.

2.4 Smartphone user segmentation

User segmentation is defined as "the classification of users into groups based on specific needs, characteristics, or behaviours." Lee et al. (2018, p. 329). The much more studied dimensions in the existing body of research on customer segmentation based on mobile product usage, such as smartphone, tablet, wearables, and so on, are demography and customer behaviour (e.g. Plaza et al., 2011; Husnjak et al., 2018; Ameen and Willis, 2018). A few other precise definitions on the requirement uniqueness led by age and gender in demography-based segmentation. According to several studies, young users are more likely to be heavily involved in smartphone use, whereas older people only use smartphones to communicate with family members (Walsh et al., 2011).

Prior studies divided smartphone user segmentation into four categories: (1) geographic segmentation based on nations, regions, cities, and so on; (2) demographic segmentation based on age, gender, income, and so on; (3) psychographic segmentation based on social class, lifestyle, and/or personality characteristics; and (4) behaviour segmentation based on occasion segmentation, benefit segmentation, and so on (Schejter et al., 2010; Chua et al., 2011; Lee et al., 2018; Ameen et al., 2018). The smartphone industry differs from other industries in that its user segmentation is far greater than in other industry sectors because smartphone owners are more integrated with their phones and exhibit a variety of behaviours and characteristics while using their smartphones (Lee et al., 2018).

2.5 Smartphone as an extension of one's self

Understanding the impact of objects on the human mind and cognitive behaviour might be possible with extended self-theory (Belk, 1988). This theory proposes that an individual's possessions can become an extension of oneself, whether knowingly or unknowingly, intentionally or unintentionally. Smartphones, as "an extension of our physical selves," can now provide a far more compelling story about people than any of their acquaintances (Vold,

2018). (Harkin, 2003, p.16; Clayton et al., 2015). Barr et al. (2015) discovered that we rely on our smartphones as an extension of ourselves to 'offload' cognitively demanding tasks such as critical thinking, and that isolation from it amplifies state anxiety and hinders executive functioning (Clayton et al., 2015). Furthermore, previous research attempted to identify behavioural segments in mobile phone markets. Chen et al. (2019), for example, attempted to define usage patterns, proposed a method to measure customer heterogeneity, and proposed a usage pattern-based customer segmentation method. The authors discovered that smartphone usage patterns can reveal essential information that can help advertisers segment their consumers based on their smartphone behaviour.

Hixon (2014) revealed that iPhone users have a higher level of education, earn more money, and work in more professional and managerial jobs, indicating that the iPhone can be used as a predictor of social success (Ma et al., 2019). Shaw et al. (2016) concluded that iPhone users are significantly less honest and humble than Android users, and our study can compensate for this inconsistency to support established brands. Despite previous research attempting to segment people according to their smartphone behaviour, there is a dearth of research comparing compassion and altruism among smartphone users in various regions of the world according to their social class and status symbol, as well as whether they use Android or iPhone.

According to studies, iPhone users demonstrate more status symbols, iPhone boosts their self-esteem, and iPhone gives them the feeling of belonging to a societal avant-garde, whereas people who own an Android phone (e.g. Samsung) believe in durability, less fancy, and functionality (Gotz et al. 2017). According to a Slickdeals (2018) survey, iPhone users get more friends, are happier, more outgoing, creative, and earn more money than Android users. Android users are much more frugal, saving money when shopping, whereas iPhone users spend more, especially on items related to self-image, such as apparel and beauty products.

While previous studies have focused on the moral aspect, little is known about the interpersonal aspect of people's behaviour, particularly when it is intended to benefit others. Among all interpersonal behaviours, altruistic behaviour and compassion are of particular interest to various multidisciplinary scholars (e.g., Ashraf and Bandiera, 2017; Klimecki et al., 2016; Pfattheicher et al., 2019) because they have a significant impact on the success of societies (Purc and Laguna, 2019; Yesil and Sozbilir, 2013; Weng et al. 2013).

This research is an effort to extend previous findings on the valuable information that smartphones will provide regarding their user. Building on findings of previous theoretical frameworks about brand personality and the effects of brand motivation on subsequent behaviour provide us with hypothesis regarding iPhone or Android smartphone users (Fitzsimons et al., 2008; Shaw et al., 2016). Previous studies linked possessing an iPhone as a status signal and it has been shown that, people in working class have higher compassion (Manstead, 2018). Therefore, in this study we predicted that iPhone users would show less prosocial (compassion and altruistic) behaviour.

3. Methods

3.1 Procedure

An online survey link (on Qualtrics) was circulated using snowball sampling method on social media sites and through an email campaign. Snowball sampling is usually adopted in a hard-to-reach population (Dusek et al., 2015). The participants for this study were in Asia Pacific, Europe and Americas with an objective of comparing how smartphone user's behaviour may unfold in the east vs west context. In addition, these three regions have a high smartphone adoption rate (GSMA, 2019). The participants were recruited using various platforms such as social media (e.g. Facebook, Instagram, LinkedIn and Twitter), email and references (references from friends, colleagues and friends of friends, word of mouth). This

method allowed the comparison of a larger population in comparison to the populations of previous studies (Wolniewicz et al., 2018; Ellis et al., 2019).

3.2 Participants

First, participants filled the information comprising behaviours (compassion and altruism). Since our hypothesis is built based on Manstead findings that people in working class have higher compassion (Manstead, 2018), in the second part of this study, we asked participants, went through the questions related to their subjective social class rank. Moreover, they mentioned to what extent they buy their phone to signal high status through it (status symbol). Subsequently, participants were asked which smartphone they currently owned.

Finally, participants answered demographic questions (e.g. age, employment status, education background and gender) and they were thanked for their participation. This study sample comprised of 509 participants, the age ranged between 18 to 68 years (M = 29, SD = 12). Majority of the respondents belong to universities and business schools and as anticipated the responses were from graduates, postgraduates, executive masters and doctoral students and professors (Look at table 1 for more details).

INSERT Table -1

3.3.Measures and analysis

We adopted validated scales to verify our hypothesis and measure the dependent variables compassion (Martin et al., 2015) and altruism (helping attitude) (Nickell, 1998), social class rank (Adler et al., 2000), as well as subjective social class rank, measured as a self-rated ranking on the social ladder (Kraus et al., 2013). Thus, in this study, we included two controlled questions related to social rank and subjective social class rank in the questionnaire. All measures were assessed using seven-point Likert scales. All dimensions presented a good reliability with a Cronbach's α higher than 0.7. In this study, we applied t-test, regression

model and *f*-statistics using R and RStudio. R and its companion graphical user interface, RStudio, are extremely popular for a variety of reasons. The first, and most obvious, advantage is that it is free open-source software that runs on any operating system compared to tools like SPSS and STATA. Second, R has stronger object-oriented programming facilities than SPSS (Ward, 2013; Liu, 2016; Haghish, 2019) and it is mainly used for statistical analysis interactivity (Kaya et al., 2019). This study adopted psych[5], Hmisc, and tidyverse libraries for analysis with ggplot2 library for charting and figures (Lanzetta et al., 2018). Extensive R programming was used to analyze various dimensions of prediction of consumers' compassion and altruism in relation to their smartphone type and usage.

4. Results

t-test was conducted for each dependent variable and the results revealed a significant difference between compassion as well as altruism score of iPhone and Android users (Table 2). Results also show that iPhone users report a significantly higher subjective social class rank compare with Android users. Moreover, iPhone is used significantly higher to signal status.

INSERT Table -2

To determine what contributes more to compassion following categorizations (Table 3) were performed and a multiple regression model (model 1) was estimated. Table 4 has significant coefficients followed by the findings of the model:

INSERT Table -3

The following multiple regression model was estimated to determine what contributes to compassion in this study.

Model–1: CompassionScore = gender + age + region + education + phone +

income +phoneStatusSignal + socialClass + ε

INSERT Table -4

The f-statistic of the estimated model (30.2 with p-value of <0.0001) inferred that Model-1 predicts several factors (Table–4) having significant causal effect on compassion. The significant variables are presented in Table 4. The model explains 40.8% of compassion score variation.

Reference subject for Model-1 is of young age, up to undergraduate education, female resident in America with irregular income, using Android smartphone with no status signal indicator at the lower social ladder. This reference subject has an average compassion score of 3.697. iPhone usage adds 0.283 to compassion score. Older age adds full one unit to comparison score whereas middle age adds only 0.52. Individual residing in Asia reduce the score by 1.2 in comparison to 0.59 decrease for Individual residing in Europe. Using phone as status signal indicator (moderately or strongly) has 0.35 addition to score and middle social ladder also adds 0.3 to the score. Higher education or being male or regular income or upper social class shows no significant impact on compassion.

Model-2 was used to determine if altruism adds to compassion. The results show a significant relationship between compassion and altruism controlling for factors described in Table-2. Significant coefficients are presented in Table-5 followed by its interpretation.

Model-2: CompassionScore = AltruismScore + gender + age + region +
education + phone +Income + phoneStatusSignal + socialClass + ε

The f-statistic of the estimated model (28.5 with p-value of <0.0001) inferred that Model-2 predicts altruism having significant causal effect on compassion along with other variables. The significant variables are presented in Table - 5. The model explains 41.3% of compassion score variation. Conditional to being altruist as per Model-2, added unit score of altruism adds 0.16 to compassion. Age shows to be a strong predictor; older age adds one full unit to score in comparison to 0.5 for middle age. Asian resident's compassion score is 1.19 units lower than that of American residents whereas individuals in Europe show a decrease of 0.56. Phone as a status signal adds 0.35 to the score and iPhone usership adds a significant 0.26 to the compassion score.

Finally, model-3 was used to determine if compassion leads to altruism conditional on phone usership. The findings indicate a significant causal relationship between altruism and compassion controlled for phone usership. Table-6 presents the estimation results followed by its interpretation.

Model-3: AltruismScore = CompassionScore + phone + ε

The f-statistic of the estimated model (10.2 with p-value of <0.0001) inferred that Model-3 predicts compassion having significant causal effect on altruism controlled by phone usage. The significant variables are presented in Table 6. As per Model-3, added unit score of compassion makes a subject's altruism go up by a significant 0.08 unit, whereas iPhone usage adds extra 0.13 units to the altruism. The study indicates that regardless of smartphone type, individuals of middle social ladder status have higher compassion score than others. In comparison, average compassion score of iPhone users is higher than that of Android users

(See Figure 1). Similarly, altruism score is also higher for individuals of middle social ladder status (see Figure 2).

INSERT Figure-1

INSERT Figure-2

The result also suggests that iPhone users have higher compassion score than Android users when the phone is used to indicate status signal. Higher number of Android users have comparatively lower compassion. Hence, both type of smartphone users purchased their phone to signal status (see Figure 3).

INSERT Figure-3

INSERT Table -7

Older female iPhone users in the US and from middle/upper social rank are the most compassionate and perceive their phones as a strong status signal sender. Young iPhone users from Europe are closer to them but have substantially lower compassion score (4.00 vs 5.48). Asian young Android users are distant counterparts with exceptionally low compassion score (3.00 vs 5.48). (See Table-7)

INSERT Table -8

Young iPhone users in Europe appear to be as altruistic as older iPhone users in the United States. By comparison, young Asian Android users do not score high on altruism (see Table-8).

5. Discussion

The purpose of this study was to determine the extent to which owning a smartphone (iPhone or Android) can reveal information about people's behaviours toward others, including a) compassion and b) altruism (helping attitude). Over the last five decades, decoding human psychology has been one of the most revolutionary fields of study in management, psychology, personality, and sociology, with over fifty epistemological perspectives and analytical methods (e.g. Schill et al., 2019; Dobson et al., 2019). According to the findings of this study, compassion and altruism can be predicted and compared among smartphone users in various regions based on social rank and status. iPhone users have a higher level of compassion and altruism than Android users. Furthermore, irrespective of smartphone type, people in the middle of the social ladder have higher compassion and altruism scores than others.

A company's important asset is its brand, as it embodies what a product or service means to consumers. Additionally, it is a component of the relationship between the business and its customers (Kotler and Armstrong, 2010). Although the brand name has a direct effect on the customer's perception of the offering's quality, knowing what behaviours the users of these brands exhibit, may help in influencing businesses in decision making. For instance, knowing that iPhone users are higher in altruism than android users might help retailers to attract new consumers. For examples, altruism can help retailers to better understand consumers' motivations to buy a product or a service, customers favouring certain groups and their moral obligations which can impact their purchase behaviour (Powers and Hopkins, 2006). Marketers strive to increase consumer response by establishing brand equity to earn consumer preference and loyalty. Thus, based on our findings, retailers can add virtue as an equity in marketing their products to masses and it may reflect how consumers think, feel, and behave when they interact with the brand.

Our findings show some region-based differences between consumers in terms of compassion. For instance, majority of female rank higher in their level of compassion in

comparison to male, our findings reveal that there are gender differences in smartphone use, which could reflect behaviour characteristics. Furthermore, our findings reveal that women in the United States lead the way in compassion, happiness, and optimism. More specifically, we found that older female iPhone users in the US and from middle/upper social rank are highly compassionate and perceive their phones as a strong status signal sender. Women, use phones mostly for communication and social purposes (Bianchi and Phillips, 2005), but while men use smartphones for information (Wei and Lo, 2006) and business (Bianchi and Phillips, 2005). As a result, we believe that as women use smartphones for higher social purposes, they are more likely to display higher social behaviour patterns such as altruism and compassion.

These findings are also consistent with the findings of the 2019 World Giving Index, which ranked the United States first as the most empathetic country (e.g., helping a stranger, donating money, and volunteering time), and this may explain why Americans are more altruistic than others. Besides that, according to Gallup research (Singer, 2015), roughly 2.3 billion people, or one-third of the global population, perform at least one altruistic act per month, and people in America and United Kingdom make altruistic grants every year. Furthermore, our findings confirm previous findings in the United States that women lead the way in compassion, happiness, and optimism (Brodeur, 2012). These findings are useful for retailers as they can gain an initial understanding of the consumers that can possibly develop compassion towards them, which previous studies have found that it can lead to subsequent actions made by consumers and can affect their relationship with companies (Meyer et al., 2019).

Furthermore, our results show that older consumers have a higher level of compassion, whereas younger populations appear to be more altruistic in this regard. Our findings show that not only do iPhone users report a higher level of status than Android users, but they also use their phone more as a status signal. These study results replicate earlier studies that show iPhone is used to display status signal, which is consistent with previous findings (Shaw et al., 2016), and our observations of social and status usage extend previous findings in

multidisciplinary perspectives (e.g. Ashraf and Bandiera, 2017; Klimecki et al., 2016; Pfattheicher et al., 2019). Finally, the findings of this study are consistent with previous findings that show that smartphone type can reveal vital information about a person's behavioural characteristics (e.g., Stachl et al., 2017; Shaw et al., 2016).

6. Theoretical contributions

This study contributes to the existing body of knowledge by being one of the first to focus on predicting two important virtue traits: compassion and altruism, relying on smartphone type and usage. Compassion and altruism have been identified as important pillars of quality relationships in psychological research. Such behaviours result in kind, loving behaviour, happiness, and qualities that, in turn, promote positive well-being (Barnard and Curry, 2011). Previous research has focused on assessing key personality traits via smartphone usage (segmentation of smartphone users) (e.g., Chittaranjan et al., 2013; De Montjoye et al., 2013; Manstead, 2018; Schoedel et al., 2018). However, there is a lack of studies focusing on compassion and altruism, considering the significance of these two factors (Yum and Lightfoot, 2005; Hur et al., 2018), Especially during times of crisis, such as COVID 19, when individuals' behaviours can evolve or shift. Our research focused on the use of two of the most popular smartphones (iPhone and Android) to identify differences in compassion and altruism among the consumers, as well as geographic and demographic segmentation. As a result, this study provides marketing and retailers with new insights into predicting smartphone-based consumer behaviour.

Our study contributes to Belk's (1988) extended self-theory, that iPhone users would possess compassionate and altruistic behaviour as the brand iPhone becomes inseparable. Additionally, our study supports this theory which demonstrated that iPhone users are more altruistic of self when they were in possession of their iPhone compared to Android. This finding demonstrates that smartphone users can perceive their iPhone as an extension of their

self, which can have a detrimental effect (i.e., altruism and compassion). Belk (1988) theory suggests that external objects become regarded as a part of the self when we can exert control or power over them, just as we might control an arm or leg. The argument is that more power or control we have over our possessions, the more intimately connected the object becomes to the self. In addition, our study extends the existing body of research (Wagner, 2011) in terms of identifying the characteristics of different segments of consumers based on their demographics and type of smartphones used.

7. Practical implications

This study's findings have significant organisational and social implications both during and after the COVID 19 crisis. When combined with smartphone usage and demographic segmentation, our results demonstrated new ways in which individuals' personality traits can be forecasted. This is critical for increasing people's well-being, kindness, and happiness. Organizations can gain a better understanding of their employees' levels of compassion and altruism by tracking their smartphone usage based on their social rank and status, as well as other demographic data. This will assist them in getting a deeper understanding of their employees and their well-being to foster a more positive organisational culture.

Furthermore, in a marketing and retail context, brands that are typically associated with humans are thought to have a personality. Such behaviours may also encourage customers to buy, use, and possess those products to convey their self-concepts.

From a managerial perspective, this study offers guidance to retailers and marketers, particularly brand and customer relationship managers, on how to develop customer relationship strategies that result virtue based competitive advantage. Consumers tend to develop strong attachments to brands they believe have values and personality associations that

align with their self-concept (Appiah et al., 2019). Thus, results from this study may offer managers to understand the importance of compassion and altruism, that may help to align their strategies and policy. Companies can use the findings of our study to better understand their employees' behavioural characteristics, primarily the level of compassion and altruism among their employees in various regions around the world, to promote these characteristics further, especially in a time of global crisis like COVID 19. Furthermore, because the findings of this study indicated that compassion is a predictor of altruism among smartphone users, it is critical for governments to be aware of the level of compassion that residents in various countries have, possibly by implementing a strategy that integrates individuals' smartphone use and demographic segmentation. Because of the importance of this personality trait, governments and policymakers are encouraged to promote it when appropriate.

Our findings may assist retailers in gaining a clear insight of how diverse groups of consumers are likely to behave or favour products based on the personality traits associated with their preferred smartphone. For example, retailers can develop a better understanding of their 1) customers' motivations in connecting with brands, 2) engaging with certain online communities of consumers, 3) the products and services that these consumers may prefer based on smartphone type, use, and 4) understanding the level of compassion and altruism among different segments of consumers. Furthermore, retailers can offer initiatives and marketing campaigns that are likely to appeal to this group of consumers, such as campaigns that benefit society, including those living in difficult conditions. Furthermore, retailers should ensure that their brands' messages and missions are more focused on helping others for specific types of consumers by tracking consumers' compassion through their smartphone use. Finally, emotional branding with a higher level of compassion targeted at the specific group of consumers identified in this study can aid in the improvement of customer-brand relationships.

8. Limitations and future research

This study has some limitations that point to new avenues for future research. Our study included respondents of various nationalities from specific continents of Asia, Europe and Americas. As we did not have an enough respondent to perform a multi-group comparison or a region-specific comparison (Shaw et al., 2016), we believe that future studies can employ specific target group to analyse them. Future studies can also collect data from other regions and other countries and groups of users and compare their findings to the findings of this research. This research adopted self-report scale, and this may have the effects of common-method variance. However, in this study, we assume that self-reports may be the most accurate means of assessing psychological characteristics, given that individuals should have better insight into their own beliefs than would outside observers (Lee et al., 2014). Some of our findings could differ from one cultural context or age groups (e.g., degree of variation in compassion and altruistic behaviour among GenX, GenY and GenZ) or religious or spiritual teachings, thus this warrants a future investigation.

Future research may also look at other factors, such as whether people who use an iPhone or an Android device have a successful career. Additionally, future research could examine the predictive ability of negative interpersonal behaviours. In the future, research based on organizational smartphone users can assist practitioners in determining whether the findings of this study aid in understanding the compassion side of workers or whether it varies by organization size or type. On the other hand, future research should examine the detrimental effects of compassion in smartphone users. For example, those who understand the dynamics of compassion can use it to enhance their personal humanitarian status or to persuade others into intimacy, debt, or dependence. Although practitioners assert that compassion and altruism were higher during the Covid-19 era, future researchers can examine whether these characteristics among smartphone users persist only until quarantines are lifted and whether,

once business resumes normalcy, will people forget about compassion and altruism behaviours.

9. Conclusion

The purpose of this paper was to examine the levels of virtue behaviours such as compassion and altruism among consumers based on the type and usage of smartphone during COVID 19. Despite a few attempts to study people's behaviour with smartphones, it remains an underrepresented field in several disciplines. The findings suggest that smartphones may be viewed as objects that influence or shape behaviour. They remain pervasive in people's lives and are likely to facilitate numerous researchers in their efforts to better understand a variety of human behaviours, particularly during times of crisis. The analysis of smartphone usage and behaviour prediction is still in its infancy, and studies like ours can support future scholars in gaining new insights into a variety of other virtue factors, including mediation and moderation effects.

References

Adler, N. E., Epel, E., Castellazzo, G., and Ickovics, J. (2000). Relationship of subjective and objective social status with psychological and physiological functioning: Preliminary data in healthy White women. *Health Psychology*, 1, 586–592.

Akbari, A. (2018). Why Your Smartphone Is Destroying Your Life: Psychology Today https://www.psychologytoday.com/us/blog/startup-yo. Accessed 22 June 2020.

Alnawas, I. and Aburub, F., (2016). The effect of benefits generated from interacting with branded mobile apps on consumer satisfaction and purchase intentions. *Journal of Retailing and Consumer Services*, *31*,313-322.

Ameen, N., and Willis. R., (2018). A Generalized Model for Smartphone Adoption and Use in an Arab Context, A Cross-country Comparison. *Information Systems Management*, 35(3), 254–274.

Ameen, N., Hosany, S. and Tarhini, A., (2021). Consumer interaction with cutting-edge technologies: Implications for future research. *Computers in Human Behavior*, *120*, 106761.

Ameen, N., Tarhini, A., Shah, M.H. and Madichie, N.O., (2020). Employees' behavioural intention to smartphone security: A gender-based, cross-national study. *Computers in Human Behavior*, 104, 06184.

Ameen, N., Willis, R., and Shah, M.H. (2018). An examination of the gender gap in smartphone adoption and use in Arab countries: A cross-national study. *Computers in Human Behavior*, 89, 148-162.

Anderson, R. E. (2017). A Worldview of the Alleviation of Suffering. In *Alleviating World Suffering* (pp. 3-34). Springer, Cham.

Appiah, D., Ozuem, W., Howell, K. E., and amp; Lancaster, G. (2019). Brand switching and consumer identification with brands in the smartphones industry. *Journal of Consumer Behaviour*, 18(6), 463-473.

Ashraf, N., and Bandiera, O. (2017). Altruistic capital. *American Economic Review*, *107*.70-75.

Baily, S. and West, M., (2020). Covid-19: why compassionate leadership matters in a crisis. https://www.kingsfund.org.uk/blog/2020/03/covid-19-crisis-compassionate-leadership. Accessed 22 June 2020.

Banjo, O. and Hu, Y. and Shyam, S. (2008). Cell Phone Usage and Social Interaction with Proximate Others (strangers). *The Open Communication Journal*, 2, 127-135

Barnard, L.K. and Curry, J.F., (2011). Self-compassion: Conceptualizations, correlates, and interventions. *Review of General Psychology*, 15(4), 289-303.

Barr, N., Pennycook, G., Stolz, J. A., and Fugelsang, J. A. (2015). The brain in your pocket: evidence that smartphones are used to supplant thinking. *Computers in Human Behaviour*. 48, 473–480.

Baston, C. D. (2011). Altruism in humans. *New York, New York: Oxford University Press*.

Baston, C. D., and Ahmad, N. (2001). Empathy-induced altruism in a prisoner's dilemma II: What if the target of empathy has defected? *European Journal of Social Psychology*, 31, 25-36.

Batson, C. D., Ahmad, N., and Stocks, E. L. (2011). Four forms of prosocial motivation: Egoism, altruism, collectivism, and principlism.

Batson, C. D., and Shaw, L. L. (1991). Evidence for altruism: Toward a pluralism of prosocial motives. *Psychological Inquiry*, 2, 107–122.

Belk, R. W. (1988). Possessions and the extended self. *Journal of consumer research*, 15(2),139-168.

Bianchi, A., and Phillips, J. G. (2005). Psychological predictors of problem mobile phone use. *CyberPsychology & Behavior*, 8(1), 39-51.

Brodeur (2012) Americans are more compassionate than we realize retrieved from https://www.brodeur.com/americans-are-more-compassionate-than-we-realize-says-brodeur-partners-research/

Carnevale, J.B. and Hatak, I., (2020). Employee adjustment and well-being in the era of COVID-19: Implications for human resource management. *Journal of Business Research*. https://doi.org/10.1016/j.jbusres.2020.05.037.

Carolus, A., Binder, J. F., Muench, R., Schmidt, C., Schneider, F., and Buglass, S. L. (2019). Smartphones as digital companions: Characterizing the relationship between users and their phones. *New Media and Society*, 21(4), 914-938.

Chávez-Segura, A., (2020). Beyond COVID-19: From Crisis to Compassion. https://www.e-ir.info/pdf/84320. Accessed 22 June 2020.

Chen, H., Zhang, L., Chu, X. and Yan, B., (2019). Smartphone customer segmentation based on the usage pattern. *Advanced Engineering Informatics*, 42, 101000.

Chittaranjan, G., Blom, J., and Gatica-Perez, D. (2013). Mining large-scale smartphone data for personality studies. *Personal and Ubiquitous Computing*, 17(3), 433–450.

Chu, L.C., (2016). Mediating positive moods: the impact of experiencing compassion at work. *Journal of nursing management*, 24(1), 59-69.

Chua, S.G., Dixon, A., Dobberstein, N., Hwang, H. and Yamamoto, N., (2011). The Mobile Ecosystem in Asia Pacific-Steering Economic and Social Impact through Mobile Broadband. Korea: *Atkearney*.

Clayton, R. B., Leshner, G., and Almond, A. (2015). The extended iSelf: The impact of iPhone separation on cognition, emotion, and physiology. *Journal of Computer-Mediated Communication*, 20(2), 119-135.

Cosley, B. J., McCoy, S. K., Saslow, L. R., and Epel, E. S. (2010). Is compassion for others stress buffering? Consequences of compassion and social support for physiological reactivity to stress. *Journal of Experimental Social Psychology*, 46(5), 816-823.

Cushing, A. L. (2011). Self-extension and the desire to preserve digital possessions. *Proceedings of the American Society for Information Science and Technology*, 48(1), 3.

Darwin, C. (2004). The descent of man and selection in relation to sex. London, England: Penguin.

De Montjoye, Y. A., Quoidbach, J., Robic, F., and Pentland, A. S. (2013). Predicting personality using novel mobile phone-based metrics. *International conference on social computing, behavioral-cultural modeling, and prediction*, 48-55, Springer, Berlin, Heidelberg.

DeSteno, D. (2015). Compassion and altruism: how our minds determine who is worthy of help. *Current opinion in behavioral sciences*, 3, 80-83.

Dobson, A. D., de Lange, E., Keane, A., Ibbett, H., and Milner-Gulland, E. J. (2019). Integrating models of human behaviour between the individual and population levels to inform conservation interventions. *Philosophical Transactions of the Royal Society B*, *374(*1781),20180053.

Dusek, G. A., Yurova, Y. V., and Ruppel, C. P. (2015). Using social media and targeted snowball sampling to survey a hard-to-reach population: A case study. International Journal of Doctoral Studies, 10, 279-299. Retrieved from http://ijds.org/Volume10/IJDSv10p279-299Dusek0717.pdf

Eldor, L., and Shoshani, A. (2016). Caring relationships in school staff: Exploring the link between compassion and teacher work engagement. *Teaching and Teacher Education*, 59, 126-136.

Ellis, D. A., Davidson, B. I., Shaw, H., and Geyer, K. (2019). Do smartphone usage scales predict behavior? *International Journal of Human-Computer Studies*, 130, 86-92.

Fehr, E., and Fischbacher, U. (2003). The nature of human altruism. *Nature*, *425* (6960), 785-791.

Fitzsimons GM, Chartrand TL, Fitzsimons, GJ. (2008) Automatic effects of brand exposure on motivated behavior: how apple makes you ''think different.'' *Journal of Consumer Research*; 35, 21–35.

Furnham, A., Treglown, L., Hyde, G., and Trickey, G. (2016). The bright and dark side of altruism: Demographic, personality traits, and disorders associated with altruism. *Journal of Business Ethics*, 134(3), 359-368.

Getz I and Marbacher L, (2020), https://www.ceotodaymagazine.com/2020/04/covid-19-only-the-altruistic-will-survive/ Accessed 24 June 2020

Gotz, F. M., Stieger, S., and Reips, U. D. (2017). Users of the main smartphone operating systems (iOS, Android) differ only little in personality. PLoS ONE, 12(5), 1–18.

Grant A.M, Dutton J.E, Rosso B.D. (2008). Giving commitment: employee support programs and the prosocial sensemaking process. *Acad. Manag. J*. 51(5), 898–918

GSMA (2019). The State of Mobile Internet Connectivity 2019. https://rb.gy/n13qnx. Accessed 17 April 2020.

Guinot, J., Chiva, R., and Mallén, F. (2016). Linking altruism and organizational learning capability: A study from excellent human resources management organizations in Spain. *Journal of Business Ethics*, 138(2), 349-364.

Haghish, E. F. (2019). Seamless interactive language interfacing between R and Stata. *The Stata Journal*, *19*(1), 61-82.

Harkin, J. (2003). Mobilisation: The growing public interest in mobile technology. London: Demos.

Hixon, T. (2014). What Kind of Person Prefers an iPhone?, *https://www.forbes.com/sites/toddhixon/2014/04/10/what-kind-of-person-prefers-an-iphone/ Retrieved February 21, 2020*

Hopkins, R.A. and Powers, T.L., (2009). Development and test of new dimensions of altruistic buying behavior. *Journal of Consumer Marketing* 26(3), 185-199

Hur, W.M., Moon, T.W. and and Ko, S.H., (2018). How employees' perceptions of CSR increase employee creativity: Mediating mechanisms of compassion at work and intrinsic motivation. *Journal of Business Ethics*, 153(3), 629-644.

Husnjak, S., Peraković, D. and and Forenbacher, I., (2018). Data Traffic Offload from Mobile to Wi-Fi Networks: Behavioural Patterns of Smartphone Users. *Wireless Communications and Mobile Computing*, https://doi.org/10.1155/2018/2608419

IDC (2020). Smartphone Market Share. https://www.idc.com/promo/smartphone-market-share/os. Accessed 17 April 2020.

Irani, A.S., (2018). "Positive Altruism: Helping that Benefits Both the Recipient and Giver". *Master of Applied Positive Psychology (MAPP) Capstone Projects*. 152. *https://repository.upenn.edu/mapp_capstone/152*

Jackson J (2020) "*https://www.forbes.com/sites/jarretjackson/2020/05/28/compassion-in-the-time-of-covid-19/#28c9153922c7* Accessed 24 June 2020

Kappes, A., Nussberger, A. M., Faber, N. S., Kahane, G., Savulescu, J., and Crockett, M. J. (2018). Uncertainty about the impact of social decisions increases prosocial behaviour. *Nature human behaviour*, 2(8),573-580.

Kaya, E., Agca, M., Adiguzel, F., and Cetin, M. (2019). Spatial data analysis with R programming for environment. Human and ecological risk assessment: *An International Journal*, 25(6), 1521-1530.

Klimecki O. M, Leiberg S, Ricard M, Singer T. (2014) Differential pattern of functional brain plasticity after compassion and empathy training. *Soc Cogn Affect Neurosci*. 9(6), 873-9. doi:10.1093/scan/nst060

Klimecki, O. M., Mayer, S. V., Jusyte, A., Scheeff, J., and Schönenberg, M. (2016). Empathy promotes altruistic behavior in economic interactions. *Scientific reports*, 6(1), 1-5.

Konsolakis, K., Hermens, H., Villalonga, C., Vollenbroek-Hutten, M., and Banos, O. (2018). Human behaviour analysis through smartphones. In *Multidisciplinary Digital Publishing Institute Proceedings*, 2(19), 1-11.

Kotler, P. and Armstrong G., (2010). Principles of Marketing. Pearson Prentice Hall, *Thirteen Edition, New Jersey, NJ*, 259-262

Kraus, Michael M. W., Jacinth JX Tan, and and Melanie B. Tannenbaum T. (2013). The social ladder: A rank-based perspective on social class *Psychological Inquiry* 24(2), 81-96.

Lachmann, B., Sindermann, C., Sariyska, R. Y., Luo, R., Melchers, M. C., Becker, B., Cooper, A. J., and Montag, C. (2018). The role of empathy and life satisfaction in internet and smartphone use disorder. *Frontiers in Psychology*, 9(MAR), 1–11.

Lähdesmäki, M., and Takala, T. (2012). Altruism in business–an empirical study of philanthropy in the small business context. *Social Responsibility Journal*, 8(3), 373-388

Lanzetta, V. B., Dasgupta, N., and Farias, R. A. (2018). Hands-On Data Science with R: Techniques to perform data manipulation and mining to build smart analytical models using R. *Packt Publishing Ltd*.

Lapierre, M.A. and Zhao, P., (2021). Smartphones and social support: Longitudinal associations between smartphone use and types of support. *Social Science Computer Review*, p.0894439320988762

Lee, S.Y. and Lee, K., (2018). Factors that influence an individual's intention to adopt a wearable healthcare device: The case of a wearable fitness tracker. *Technological Forecasting and Social Change*, 129, 154-163.

Lee, Y. K., Chang, C. T., Lin, Y., and Cheng, Z. H. (2014). The dark side of smartphone usage: Psychological traits, compulsive behavior and technostress. *Computers in human behavior*, 31, 373-383.

Lee, Y., Park, I., Cho, S. and Choi, J., (2018). Smartphone user segmentation based on app usage sequence with neural networks. *Telematics and Informatics*, 35(2),329-339.

Lemire, F. (2019). Caring and compassion in a digital world. *Canadian Family Physician*, *65 (7)*, 520-520.

Lilius, J.M., Worline, M.C., Maitlis, S., Kanov, J., Dutton, J.E. and Frost, P., (2008). The contours and consequences of compassion at work. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior*, 29(2), 193-218.

Liu, X. (2016). Fitting Proportional Odds Models for Complex Sample Survey Data with SAS, IBM SPSS, Stata, and R. *General Linear Model Journal*, *42*(30–39), 12.

Lord.M (2017). Why We Need Empathy In A Digital World (retrieved from https://www.theceomagazine.com/business/management-leadership/need-empathy-digital-world/. Accessed on 28 April 2020.

Lu, T., and McKeown, S. (2018). The effects of empathy, perceived injustice and group identity on altruistic preferences: Towards compensation or punishment. *Journal of Allied Social Psychology*, 48(12), 683-691

Ma, S., Sehrawat, A., and PK, S. K. (2019). iPhone as a proxy indicator of adaptive narcissism: An empirical investigation. *Psychology and Marketing*, 36(10), 895-904.

Manney, P. J. (2015). Is Technology Destroying Empathy. _ https://www.livescience.com/51392-will-tech-bring-humanity-together-or-tear-it-apart.html. Accessed on April 20, 2020.

Manstead, A. S. (2018). The psychology of social class: How socioeconomic status impacts thought, feelings, and behaviour. *British Journal of Social Psychology*, 57(2), 267-291.

Martin, D., Seppala, E., Heineberg, Y., Rossomando, T., Doty, J., Zimbardo, P., Shiue, T.T., Berger, R. and Zhou, Y., (2015). Multiple facets of compassion: The impact of social dominance orientation and economic systems justification. *Journal of Business Ethics*, 2015, 129(1), 237-249

McLean, G., Al-Nabhani, K. and Wilson, A., (2018). Developing a mobile applications customer experience model (MACE)-implications for retailers. *Journal of Business Research*, *85*, 325-336.

Meyer, F., Huber, F. and Huber, S., (2019). The suffering company: Consumer compassion towards companies exposed to negative events. *Psychology & Marketing*, 36(4), .321-341.

Mønsted, B., Mollgaard, A., and Mathiesen, J. (2018). Phone-based metric as a predictor for basic personality traits. *Journal of Research in Personality*, 74, 16-22.

Neff, K. D., and Seppala, E. (2016). Compassion, well-being, and the hypo-egoic self. *Oxford Handbook of Hypo-egoic Phenomena*, 189-202.

Nickell, G. (1998). The Helping Attitudes Scale. *Paper presented at 106th Annual Convention of the American Psychological Association at San Francisco*

Park, N., and Lee, H. (2012). Social implications of smartphone use: Korean college students' smartphone use and psychological well-being. *Cyberpsychology, Behavior, and Social Networking*, 15(9), 491-497.

Park, S. Q., Kahnt, T., Dogan, A., Strang, S., Fehr, E., and Tobler, P. N. (2017). A neural link between generosity and happiness. *Nature Communications*, 8,1–10.

Pfattheicher, S., Sassenrath, C., and Keller, J. (2019). Compassion magnifies third-party punishment. *Journal of personality and social psychology*, 117(1), 124-141.

Plaza, I., Martín, L., Martin, S. and Medrano, C., (2011) Mobile applications in an aging society: status and trends, *Journal of System Software* 84(11), 1977–1988

Powers, T.L. and Hopkins, R.A., (2006.) Altruism and consumer purchase behavior. *Journal of International Consumer Marketing*, *19*(1), 107-130.

Purc, E., and Laguna, M. (2019). Factorial structure and measurement invariance of the Innovative Behavior Questionnaire. *The Journal of Creative Behavior*, 53(3), 404-410.

Retail-Consumer-Experience-(2019): https://www.retailcustomerexperience.com/news/convenience-compassion-top-consumer-wants-reveals-survey/ Accessed on April 04, 2020

Reinfelder, L., Benenson, Z., and Gassmann, F. (2014). Differences between Android and iPhone users in their security and privacy awareness. In *International Conference on Trust, Privacy and Security in Digital Business*, 156-167

Rhiu, I. and Yun, M.H., (2018). Exploring user experience of smartphones in social media: A mixed-method analysis. *International Journal of Human–Computer Interaction*, *34*(10), 960-969.

Schejter, A.M., Serenko, A., Turel, O. and Zahaf, M., (2010). Policy implications of market segmentation as a determinant of fixed-mobile service substitution: What it means for carriers and policy makers. *Telematics and Informatics*, 27(1), 90-102.

Schill, C., Anderies, J. M., Lindahl, T., Folke, C., Polasky, S., Cárdenas, J. C., and Schlüter, M. (2019). A more dynamic understanding of human behaviour for the Anthropocene. *Nature Sustainability*, 1-8.

Schneider, F.M., Rieger, D., Hopp, F.R. and Rothmund, T., (2018). First aid in the pocket: The psychosocial benefits of smartphones in self-threatening situations. In *I n Paper presented at the 68th annual conference of the international communicatio n association (ICA). Prague, Czech republic*.

Schoedel, R., Au, Q., Völkel, S. T., Lehmann, F., Becker, D., Bühner, M., Bischl, B., Hussmann, H., and Stachl, C. (2018). Digital footprints of sensation seeking: A traditional concept in the big data era. *Zeitschrift für Psychologie*, 226(4), 232–245.

Seligman, M. E. P., and Csikszentmihalyi, M. (2000). Positive psychology [Special issue]. *American Psychologist*, 55(1), 5-14.

Seppala, E. M., Simon-Thomas, E., Brown, S. L., Worline, M. C., Cameron, C. D., and Doty, J. R. (Eds.). (2017). *The Oxford handbook of compassion science*. Oxford University Press.

Seppala, E., Rossomando, T., and Doty, J. R. (2013). Social connection and compassion: Important predictors of health and well-being. *Social Research: An International Quarterly*, 80(2), 411-430.

Seppala, E., Simon-Thomas, E., Brown, S. L., Worline, M. C., Cameron, C. D., and Doty, J. R. (Eds.). (2017). The Oxford handbook of compassion science. *New York: Oxford University Press.*

Shahzad, K., and Muller, A. R. (2016). An integrative conceptualization of organizational compassion and organizational justice: a sensemaking perspective. *Business Ethics: A European Review*, *25(*2), 144-158.

Shapira, L. B., and Mongrain, M. (2010). The benefits of self-compassion and optimism exercises for individuals vulnerable to depression. *The Journal of Positive Psychology*, 5(5), 377-389.

Shaw, H., Ellis, D. A., Kendrick, L. R., Ziegler, F., and Wiseman, R. (2016). Predicting Smartphone Operating System from Personality and Individual Differences. *Cyberpsychology, Behaviour, and Social Networking*, 19(12), 727–732.

Simpson, A. V., Farr-Wharton, B., and Reddy, P. (2020). Cultivating organizational compassion in healthcare. *Journal of Management & Organization*, 26(3), 340-354.

Singer P (2015), How Altruism makes the world a better place https://www.japantimes.co.jp/opinion/2015/04/21/commentary/world-commentary/how-altruism-makes-the-world-a-better-place/ Accessed on June 24 2020

Slickdeals (2018) https://nypost.com/2018/10/25/iphone-and-android-users-are-completely-different-people/ Accessed on April 20 2020

Snyder, C. R., and Lopez, S. J. (Eds.). (2009). *Oxford handbook of positive psychology*. Oxford library of psychology.

Stachl, C., Hilbert, S., Au, J. Q., Buschek, D., De Luca, A., Bischl, B. and Bühner, M. (2017). Personality traits predict smartphone usage. *European Journal of Personality*, 31(6), 701-722.

Tellier, A.L.E. (2013). On how smartphones are killing compassion, https://www.latimes.com/opinion/la-xpm-2013-sep-20-la-ol-louis-ck-smartphones-conan-compassion-20130920-story.html. Accessed on April 28 2020.

Van der Cingel, M. (2011). Compassion in care: A qualitative study of older people with a chronic disease and nurses. *Nursing ethics*, 18(5), 672-685.

Vold, K. (2018). Is Your Smartphone an Extension of Your Mind rb.gy/mpyxxv. Accessed on April 28, 2020

Wagner, J., (2011), *Anytime/anywhere - Playing Catch up with the Mind of the Smartphone Customer*, *International Journal of Mobile Marketing*,6(1).

Walsh, S. P., White, K. M., and Young, R. M. (2011) Needing to connect: the effect of self and others on young people's involvement with their mobile phones, *Australian Journal of Psychology*. 62(4), 194–203.

Wang, A. C., Tsai, C. Y., Dionne, S. D., Yammarino, F. J., Spain, S. M., Ling, H. C., ... and Cheng, B. S. (2018). Benevolence-dominant, authoritarianism-dominant, and classical paternalistic leadership: Testing their relationships with subordinate performance. *The Leadership Quarterly*, 29(6), 686-697.

Wang, W., (2017). Smartphones as Social Actors? Social dispositional factors in assessing anthropomorphism. *Computers in Human Behavior*, *68*, 334-344.

Ward, B. W. (2013). What's Better—R, SAS®, SPSS®, or Stata®? Thoughts for Instructors of Statistics and Research Methods Courses. *Journal of Applied Social Science*, *7*(1), 115-120.

Wei, R. and Lo, V-H. (2006), Staying connected while on move: cell phone use and social connectedness, *New Media Society*, 8(1), 53-72

Weng, H. Y., Fox, A. S., Shackman, A. J., Stodola, D. E., Caldwell, J. Z. K., Olson, M. C., Rogers, G. M., and Davidson, R. J. (2013). Compassion Training Alters Altruism and Neural Responses to Suffering. *Psychological Science*, 24(7), 1171–1180.

Wiljer, D., Charow, R., Costin, H., Sequeira, L., Anderson, M., Strudwick, G., Tripp, T., and Crawford, A. (2019). Defining compassion in the digital health age: Protocol for a scoping review. *BMJ Open*, 9(2), 1–7.

Wolniewicz, C. A., Tiamiyu, M. F., Weeks, J. W., and Elhai, J. D. (2018). Problematic smartphone use and relations with negative affect, fear of missing out, and fear of negative and positive evaluation. *Psychiatry research*, 262. 618-623.

Yan, Z., Gaspar, R., and Zhu, T. (2019). Emerging technologies, human behavior and human behavior and emerging technologies. *Human Behavior and Emerging Technologies*, 1(1), 1-3

Yesil, S., and Sozbilir, F. (2013). An empirical investigation into the impact of personality on individual innovation behaviour in the workplace. *Procedia-Social and Behavioral Sciences*, 81, 540-551.

Yum, T., and Lightfoot, E. (2005). The effects of volunteering on the physical and mental health of older people. *Research on Aging*, 27(1), 31-55

Zhang, V. (2020). How technology can relieve the impact of COVID-19?. https://www.techuk.org/insights/opinions/item/17572-how-technology-can-relieve-the-impact-of-covid-19. Accessed 22 June 2020.

Appendix A: Measurement scales
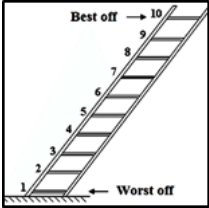
Measures	Measurement items
Compassion (Martin et al., 2015)	1. People will take advantage of me if they see me as too compassionate. 2. Being compassionate toward people who have done bad things is letting them off the hook. 3. There are some people in life who don't deserve compassion. 4. I fear that being too compassionate makes people an easy target. 5. I worry that if I am compassionate, vulnerable people can be drawn to me and drain my emotional resources. 6. Being too compassionate makes people soft and easy to take advantage of.
Altruism (Nickell, 1998)	1. Helping others is usually a waste of time. (codes are reversed). 2. When given the opportunity, I enjoy aiding others who are in need. 3. Helping friends and family is one of the great joys in life. 4. Volunteering to help someone is very rewarding. 5. Doing volunteer work makes me feel happy. 6. I donate time or money to charities every month. 7. Unless they are part of my family, helping the elderly isn't my responsibility. (codes are reversed) 8. Children should be taught about the importance of helping others. 9. I plan to donate my organs when I die with the hope that they will help someone else live.
MacArthur scale of subjective social status Adler et al., (2000)	At the top of the ladder are the people who are the best off, those who have the most money, most education, and best jobs. At the bottom are the people who are the worst off, those who have the least money, least education, worst jobs, or no job. Please place an 'X' on the rung that best represents where you think you stand on the ladder."

Table1 Demographic characteristics of participants

Demographic characteristics	
Participants Gender and their smartphones' type	61% female 31% Female iPhone owners 30% female Android owners 39% Male 11% Male iPhone owners 28% Male Android owners
Participants Location (Continent)	58% from East (Asia Pacific) 42% from West (17 % Europe& 17 % America)
Participants Education	55% Up to bachelor's degree
Participants Employment	56% Students 29% Employed professionals

Table 2 Results of t-test

Variable	iPhone (n = 207)		Android (n = 302)		t value	p value
	M	SD	M	SD		
Compassion	4.4	0.87	3.3	1.33	9.39	<0.01
Altruism	6.4	0.08	6.2	0.34	3.45	<0.01
Social class rank	7.1	0.05	6.8	0.62	2.72	0.02
Status symbol	2.4	0.15	2.0	0.60	-3.53	<0.01

Table 3 Controlling factors category

Demographics	Description	Category	Description
Age	Young, Middle age, Older	Phone as status signal	No, Moderate, Strong
Gender	Female, Male	Social class	Lower, Middle, Higher
Region	Asia, Europe, Americas	Income	Regular, Irregular
Education	Under-graduate, Graduate or Higher	Phone type	iPhone, Android

Table 4 Estimation results for Model-1

Variable	Coefficient	t-statistic	p-value
Intercept	3.6970	12.6	<0.0001
Age (middle age adult)	0.5164	3.27	0.0012
Age (older age adult)	1.0188	4.63	<0.0001
Region (Asia)	-1.2077	-5.87	<0.0001
Region (Europe)	-0.5871	-2.93	0.0036
Phone status signal (moderate)	0.3481	1.79	0.0743
Phone status signal (strong)	0.3658	2.14	0.0330
Social class (middle)	0.3022	2.36	0.0185
Phone type (iPhone)	0.2832	2.19	0.0293

Table 5 Estimation results for Model-2

Variable	Coefficient	t-statistics	p-value
Intercept	2.7047	5.32	<0.0001
Altruism score	0.1550	2.38	0.0176
Age (middle age adult)	0.5024	3.19	0.0015
Age (older age adult)	1.0232	4.68	<0.0001
Region (Asia)	-1.1876	-5.79	<0.0001
Region (Europe)	-0.5641	-2.82	0.0050
Phone status signal (moderate)	0.3462	1.79	0.0745
Phone status signal (strong)	0.3614	2.12	0.0343
Social class (middle)	0.3040	2.39	0.0172
Phone type (iPhone)	0.2578	1.99	0.0469

Table 6 Estimation results for Model-3

Variable	Coefficient	t-statistic	p-value
Intercept	5.9523	64.49	<0.0001
Compassion score	0.0774	3.07	0.0022
Phone type (iPhone)	0.1310	1.84	0.0657

Table 7 Summary of compassion score

Number	%size	Score	Description
56	11%	5.48	iPhone, Americas, older, female, strong phone status, middle/upper social class
106	21%	2.94	Android, Asia, young, female, moderate/strong phone status
86	17%	3.07	Android, Asia, young, male, moderate/strong phone status
55	11%	4.00	iPhone, Europe, young, middle/upper social class

Table 8 Summary of findings of altruism score

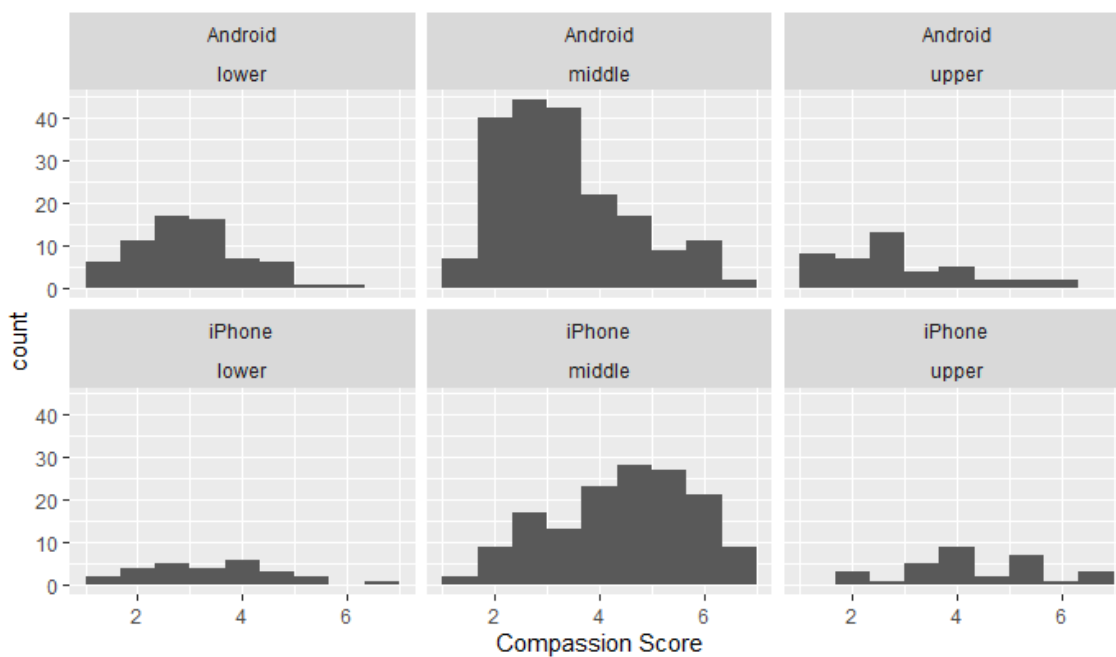| Number	%size	Score	Description
67	13%	6.4	iPhone, Europe, Young adult
202	40%	6.2	Android, Asia, Young adult
58	11%	6.5	iPhone, Americas, Older adult

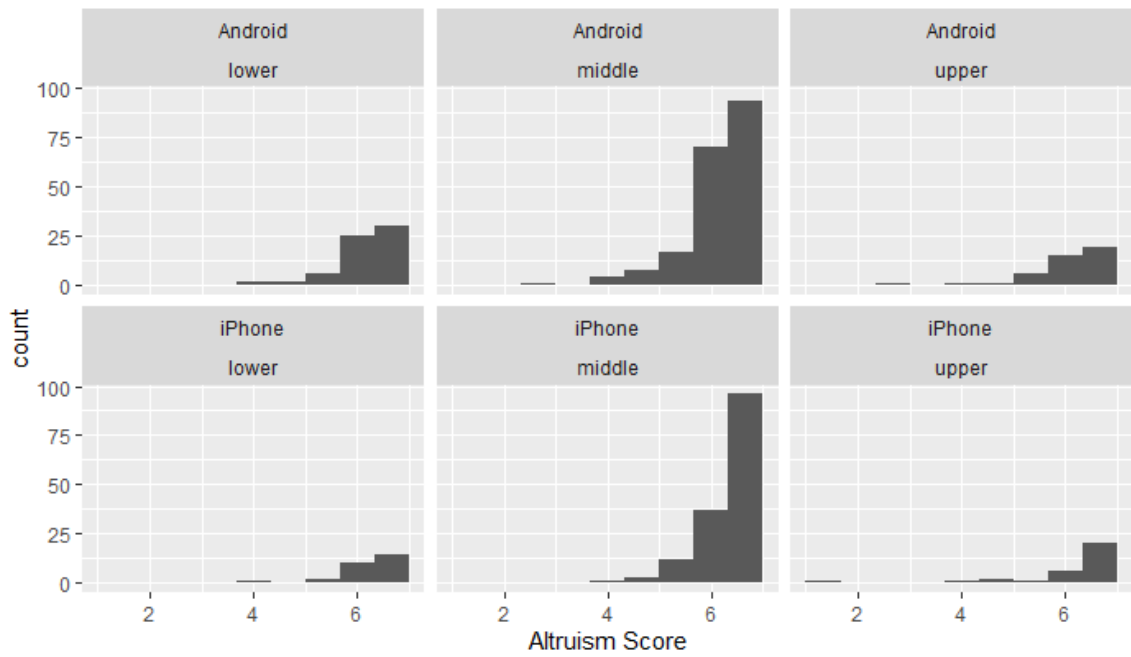**Figure 1** Compassion score of smartphone owners based on social class rank

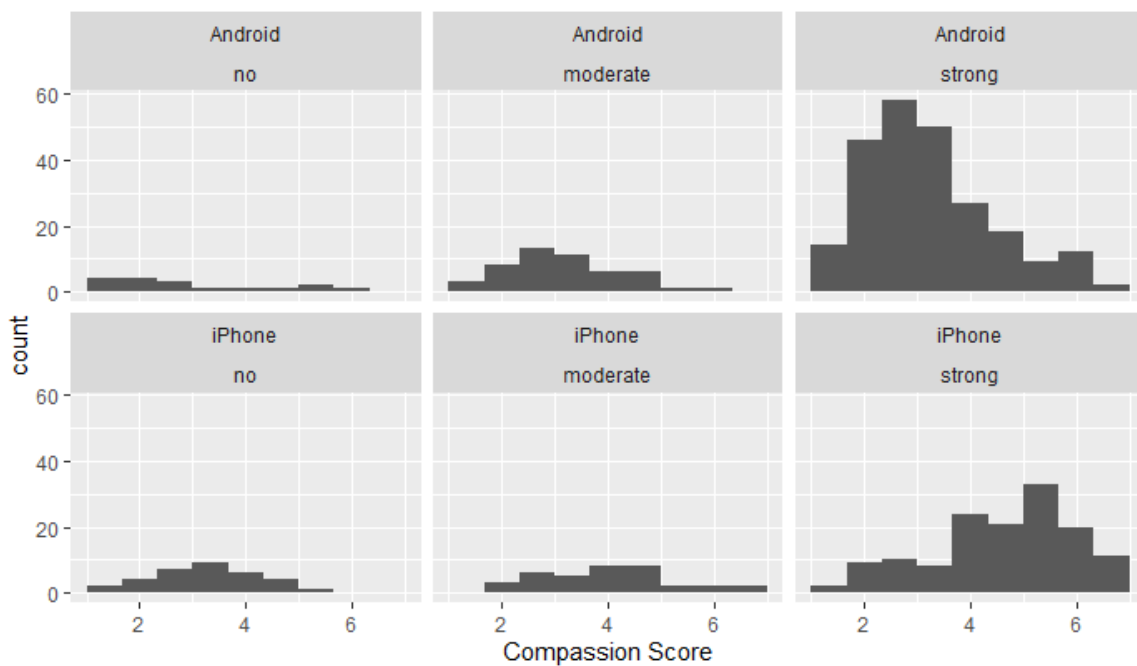**Figure 2** The level of altruism of smart phones based on the subjective social class rank

Figure 3 Compassion score of smartphone owners using phone as status signal