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# Measuring user emotionality on online videos: A comparison between self-report and facial expression analysis.

## Abstract

One common factor that unites the popularity of online video viewers is their virality. Marketers and academics have been involved in the contemporary research not only to understand how online virality occurs but in addition how it can be measured. Thus, the aim of this paper is threefold: a) to advance the understanding of what online video virality is b) to propose a conceptual framework for measuring video virality c) to evaluate two main contrasting methods for measuring video virality. The conceptual framework identifies key elements to video virality as emotions and social groups, and the tools proposed to be used for measuring online video virality is the FaceReader and the online web questionnaire. The findings from the study indicate the existence of discriminant validity between the two methods which inherently adds to the theoretical advancement with the notion that video marketers or researchers cannot use self-report to measure emotions or use it synchronously with facial expression analysis on online videos.

Joseph Asamoah

## 1.0 Introduction

The need to obtain views from online sharing platforms such as YouTube is important as viral views provide free advertising and beyond it can represent deeper brand engagement which allows for further interaction such as replaying the video, rating it (liking or disliking), adding a comment and most significantly forwarding it to a friend to continue the viral cycle (Southgate, Westoby and Page,2010). Viral videos have had a profound social impact of many aspects of society such as politics and online marketing. For example, during the 2012 US presidential election, Obama style and Mitt Romney style, the parodies of the famous Gangnam Style, both peaked on election day and received approximately 30 million views within a month before election day (Jiang et al.,2014). Teixeira et al. (2012) explains that viral video ads are increasingly being used by advertisers as brand building tools because of their potential to engage viewers more than traditional TV ads. The reasoning is that the sharing of these ads among acquaintances increases attention and interest. Further, since it requires little to no paid media, viral ads are also viewed as a lower cost approach to television. Keane (2010) disagrees and reckons that the key to a viral video success relies on a big add budget. The argument is that videos that got watched the most on the Internet are those that bought their popularity through traditional offline advertising, especially on TV. The fact is that the relationship between an advertising budget and a video's popularity online is not the same as the connection between online popularity and box office revenue. Notwithstanding, the challenge that brands face in using viral ads is that it is a very uncertain process with many more ads failing to reach a sizable audience than succeeding (Watts and Peretti, 2007), One key explanation for this is that we still know very little about what content causes ads to go viral (Godes et al. 2010). Berger (2013, p. 6) affirmed that there's "no difference in price (all are free to watch) on videos, and few videos receive any advertising or marketing push. Although some videos have

higher production values, most that go viral are blurred and out of focus, shot by an amateur on an inexpensive camera or cell phone, so if quality, price and advertising doesn't explain why one YouTube video gets more views what does?"

To answer that question Porter, Lance and Golan (2006) explains that it is primarily due to content, Bampo et al (2008) point to social network structure, Wonjnicki and Godes (2011) indicate seeding strategies whilst Dobebe et al., (2007); Berger and Milkman (2012); Nelson-Field,Reibe and Newstead (2013) assume elements of emotional arousal. This paper leans towards the premise that emotions are an important catalyst for virality based on the conclusions from the findings and the varying methods used to measure emotional content within its distinct context. After people have experienced an emotional response to content, they consider the option of passing the content on to their social networks (Feder,2014). Rime (2009) shows that when people have emotional episodes they tend to interact socially. The Social Sharing of Emotion theory explains why people aim to connect with others after emotional experiences, and how this sharing of emotional content, in turn, causes emotional reactions in others (Christophe and Rime,1997). Online social networks provide viewers with an immediate avenue to socially share the emotions that were elicited by the content. Within the social network an individual's group (i.e fan base) is a moderating factor on the extent a video will be shared once the element of emotion has been amplified. For example, a Manchester United football fan will not share an amusing video content with other people of a rivals Arsenal player scoring a wonder goal even though the video has positively elicited the fan.

The key question then is how can we measure emotions and incorporate social groups to ascertain the extent a video stimulus has gone viral since it has been established that there is a direct correlation? Kuilenberg, Wiering and Uyl (2005) noted that apart from the means to identify other members of the species the human face provides several signals essential for inter-personal communication in our social life, personality, attractiveness, age and gender can also be seen from someone's face. Thus, the face is a multi-signal sender/receiver capable of tremendous flexibility and specificity. In turn, automating the analysis of facial signals would be highly beneficial for fields as diverse as security, behavioural science, medicine, communication, education, and human-machine interaction. An example is the Facial Expression Analysis Tool also known as the **FaceReader**. The FaceReader can categorize expressions corresponding to one of the 6 basic emotions as defined by Ekman (1992) plus neutral and categorises the emotional valence of the expression and some personal characteristics like gender and age. It also allows a user to set other independent variables that cannot be automatically captured that meet the objectives of the study such as employment and location. The use of a questionnaire embedded with a video stimulus can also be used to gain a objective insight on a user's emotionality.

## 1.1 Theoretical Framework

After people have experienced an emotional response to content, they consider the option of passing the content on to their social networks (Feder,2014). Rime (2009) shows that when people have emotional episodes they tend to interact socially. The Social Sharing of Emotion theory explains why people aim to connect with others after emotional experiences, and how this sharing of emotional content, in turn, causes emotional reactions in others (Christophe and Rime,1997). Online social networks provide viewers with an immediate avenue to socially share the emotions that were

elicited by the content. Viral marketing authors contend that there are various social reasons why people share content online: to increase their status (Chu, 2011; Lagger et al., 2011; Roy, 2011), out of altruism (Phelps et al., 2004; Roy, 2011), to allow others to laugh (Lagger et al. 2011; Roy, 2011), to inform others (Lagger et al., 2011), or for economic incentives (Roy, 2011). However, authors disagree about which specific social reasons drive the sharing of content online. These social motivations for the spread of content online need further investigation especially within a theoretical context.

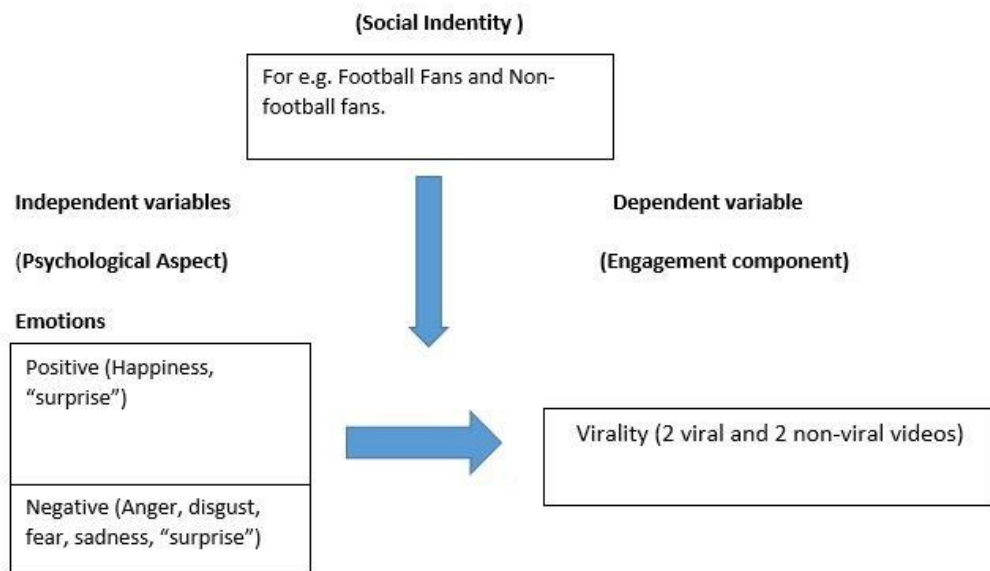
Rime et al. (1992) explored the phenomenon as to whether people share their emotions, whether they do it more readily than others, how often and with whom they speak about such experiences. The findings showed that most emotional experiences are shared with others shortly after they have occurred, and that social sharing of emotions represents an integral part of emotional experiences. Wagner et al. (2014) supported the stance to explain that one of the most fundamental characteristics of human beings is their social nature where there is a need to form social bonds to share experiences. By socially sharing their experiences individuals can modify their subjective perceptions of these experiences in a positive manner. Wagner et al. (2014) illustrated that when people go to the cinema, they rarely do so alone but in most cases go together with a partner or a friend. Apart from expecting to be emotionally moved by the film itself, they anticipate a positive impact of sharing this emotional experience with a peer, even though both are passively watching an event and there are only minimal opportunities to talk to each other during the viewing.

The Social Identity Theory was first proposed by Tajfel (1979). It is a theory that explains cognitions and behaviour of people with the help of group processes (Trepte, 2006). According to the Social Identity Theory (SIT), people tend to classify themselves and others into various social categories such as organisational memberships, religious affiliations, gender and age cohort, fans of a TV series, sporting clubs or members of a university etc (Trepte, 2006). Stets and Burke (2000) noted that a social identity is a person's knowledge that he or she belongs to a social category or a group. A social group is a set of individuals who hold a common social identification or view themselves as members of the same category. Through a social comparison process, persons who are like the self and are labelled the "in-group"; persons who differ are categorized as the "out-group" (Stets and Burke, 2000).

An aspect of social identity is social validation which is the tendency for individuals to look to others to see what others are doing to determine if a behaviour is normative and appropriate (Guadagno et al, 2013). In environments where the correct course of action is ambiguous, people rely even more heavily on the cues provided by others. People are also more likely to follow the cues of others when the others are a member of their in-group and thus more like them. In a one such study, Salganik, Dodds, and Watts (2006) created a laboratory "music market" online where 14,000 participants could download songs they had never been exposed to previously. The researchers manipulated whether participants were made aware of other participants' choice to download a song. The results of the study demonstrated that increasing cues of social validation (providing participants with knowledge of other participants' download choices) decreased the predictability of success based on song quality. Thus, in relations to online videos, when one receives a forward from an in-group member, that may serve as a signal that the video is appropriate to forward to others. To contextualise a Salford City Football fan

who attends either home and away games of the team, buys the clubs paraphernalia and merchandise, *will watch and share football video highlights on YouTube with fellow Salford City football fans who have a strong inclination to associate with the ideals and do likewise*. Such a strong inclination to identify and participate within an emotional context can be further explained using the conceptual framework as seen below:

## 1.2 Conceptual Framework



**Figure 1. Framework for measuring virality.**

The conceptual framework underscores that a viral video is dependent on psychological aspect called **emotions**. The emotionality elicited are derived from a set of both football fans and non-football fans (The football fans are not necessarily Salford City Fans, but fans of football who may support other opposing teams). Emotional experiences can be described by positive and negative emotions. Social Identity (groups) determines the relationship strength between a viral video and emotions within the context of football related videos (i.e. moderating variable). Virality is the outcome from the effect from emotions and social identity groups. The notion of what virality is subject to debate and is often contradicted. For example, Adweek regards the **number of shares** as the metric to assess the virality of an online advertisement (Nudd,2014) whilst AdAge.com (2015) highlights **the number of views**. This paper encapsulates and combines both views and shares where virality is denoted in this paper by the extent a video is shared over a period as it accumulates views. In the conceptual framework the emotions are independent variables whilst the viral and non-viral videos represent the dependent variable.

## 2.0 Methodology

Dobele et al.,2007; Berger & Milkman (2012); Feroz Khan & Vong (2014) used a set of questionnaires and textual coding to conduct their studies to conclude that certain emotions when elicited cause sharing whilst Southgate et al., (2010) used interviews. Similarly, Zaman and Smith (2006); Harley (2015) used the FaceReader in conjunction with other methods albeit in a different context. This study on the other hand assessed

the use of the FaceReader recognition software in relation to online web questionnaire embedded with video stimuli.

## **2.1 Participants**

A total of 60 respondents (32 football fans and 28 non-football fans) filled both the online web questionnaire and undertook the facial expression analysis which was used as the main basis for the study. The respondents comprised lecturers and students from the university as well as carefully selected respondents selected from a freelance website ([www.peopleperhour.com](http://www.peopleperhour.com)). On the PeoplePerHour page project bid page instructions on how to undertake the project with links to the testing page were provided. Participants from the PeoplePerHour website were selected after they sent a proposal. The proposal sent comprised the participants interest in undertaking the project, the time they will take to complete the project and the fee they will charge which has to be within the stipulated price quoted by the researcher for undertaking the project. The instructions took the participants to the testing page on Google forms which also had further instructions on how to undertake the project. Face to face participants were solicited via email or in person. Accepted proposals from the PeoplePerHour website took into consideration the gender and location, and whether they were football fans or non-football fans to get a balanced perspective from the participants.

Do note that where  $N < 32$  football fans and  $N < 28$  Non-football fans it is primarily due to some participants data being omitted as a result of calibration problems using the facial expression analysis software\*.

## **2.2 Materials**

To undertake the study the data was obtained from two methods which are objective and subjective in nature and were run concurrently. Subjective methods include questionnaires surveys which as the name indicates relies on the subjective nature of the responses which sometimes can lead to bias, in that participants offer the researcher information they think is wanted, rather than describing the reality (Wilson, 2002). Objective methods include observations, interviews, analysing written texts and documents etc. Oates (2006) explains that objective data is richer and more detailed and offers more than just numbers whilst also offering an alternative explanation rather than a presumption that there will be one correct explanation.

Users who participated in this research study had to be at a stationary sitting where they filled an online questionnaire using Google forms which contained embedded video content to which they had to watch 2 viral videos and 2 non-viral videos as they were recorded using the FaceReader 6 platform or they could do the test remotely (This also involved filling the online questionnaire and having a self-recording of themselves which was subsequently uploaded into a dropbox for further facial expression analysis). The online web questionnaire also measured each participant subjective self-report of their emotions and other factors such as the likelihood to share and how often they watch YouTube videos, whether they were football fans etc.

### **2.2.1 Video Stimuli**

The first video depicted a wonderfully struck long-range goal from the centre of the football field reminiscent of strikes from more renowned professional footballers such as David Beckham, it was scored by an ex-Salford City player known as James Poole.

It is an organic video in its intrinsic sense, which means it did not have a huge production budget backed by a huge digital marketing campaign. The second video depicted Manchester United players acting for a pre-release trailer for a movie – “Independence Day Resurgence”. The second video had a huge production budget and was run with a digital marketing campaign. The two variant viral videos, one **organic** and one **commercial** were specifically chosen for a more robust comparative analysis. The third video showed ex- Manchester United Defender Gary Neville discussing the promotion of Salford City FC. The fourth video depicted a celebratory scene as Salford City FC gained promotion. All the videos were less than 4 minutes in length. The first and second video (viral videos) were chosen due to their widespread circulation – (Video 1 harnessing 64, 476 views and 142 shares; Video 2 harnessing 257,757 views and 326 shares) and hypothesised ability to induce a measurable variation in the mean emotional intensities. The main variables measured using the facial expression analysis study were the mean emotion intensities of each participant as well as the valence and the arousal.

### 2.3 Experimental design

CIRT (2018) explains that experimental design is concerned with the effect of the examination of the independent variable, where the independent variable is manipulated through treatment of interventions and the effect of interventions. CIRT (2018) identifies three basic types of experimental research designs. These include pre-experimental designs, true experimental designs, and quasi-experimental designs. The degree to which the researcher assigns subjects to conditions and groups distinguishes the type of experimental design. CIRT (2018) makes a distinction on the different types of true experimental designs. True experimental designs are characterized by the random selection of participants and the random assignment of the participants to groups in the study. The researcher also has complete control over the extraneous variables. McLeod (2017) identified three types of experimental designs: Independent measures, repeated measures and matched-pairs whilst Oates (2013) noted: one -group, pre-test and post-test, static group comparison, pre-test/ Post-test control group and Solomon four-group design. Some of the characteristics of the designs, pros and cons is examined in the table below:

<b>Design Type (Characteristics)</b>	<b>Pros</b>	<b>Cons</b>	<b>Does this study meet the criteria?</b>
Independent Measures (Between groups). In this type of experimental design each condition of the experiment includes a different group of participants. This is done by random allocation which	Avoids <b>order effect</b> as people participate in one condition only. If a person is involved in several conditions, there is a tendency for boredom or fatigue.	It usually involves a lot of participants.  Differences between participants in the groups may affect results, for example; variations in age, gender or social background. These differences are known as participant variables.	No, as this study requires the same set of participants.

ensures that each participant has an equal chance of being assigned to one group or the other.			
Repeated Measures (Within groups). Each condition of the experiment includes the same group of participants.	As the same participants are used in each condition, participant variables (i.e., individual differences) are reduced.  Fewer people are needed as they take part in all conditions (i.e. saves time).	There may be order effects. <b>Order effects</b> refer to the order of the conditions influencing the participants' behaviour. Performance in the second condition may be better because the participants know what to do (i.e. practice effect). Or their performance might be worse in the second condition because they are tired (i.e., fatigue effect). This limitation can be controlled using <b>counterbalancing</b> .	<b>Yes, as all participants partake in both methods (i.e facial expression analysis and self-report (questionnaire) and are subject to the measurement of their emotions elicited from watching the same two video stimuli.</b>
Matched – Pairs. Each condition uses different but similar participants. An effort is made to match the participants in each condition. In terms of any important characteristic which might affect performance, e.g., gender, age, intelligence, etc.	Reduces participant variables because the researcher has tried to pair up the participants so that each condition has people with similar abilities and characteristics.  Avoids order effects, and so counterbalancing is not necessary.	If one participant drops out, you lose 2 personal participants data.	No, the participants are the same in both conditions.
One – group, pre-test and post-test. The participants performance is measured, the researchers then	By comparing the before and after scores, the researchers can assess the effects	The researchers cannot determine if time have had an effect – the participant might have just gotten better with	No, the test condition is done in parallel and not using a pre-test and



apply some treatment, they then measure the participants performance again.	of the treatment efficiently.	time without the researcher's input.	post-test approach.
Static group comparison. The participants are divided into two groups. The researchers apply the treatment to one group and do nothing to the other group. The performance of both groups is then measured.	Difference in groups can be explained by the treatment.	If participants are not randomly assigned to the two groups, any difference might be caused by other factors than the treatment.	No, as the treatment is applied to both groups.
Solomon four – group design. This design controls for the possibility of pre-testing affecting subsequent performance. Participants are randomly assigned to four groups. Using the Solomon four-group design, subjects are randomly assigned to one of four different groups. Two of the groups receive the treatment (i.e. intervention) and two do not (i.e. control).	<p>Researchers using this design can examine both the main effects of testing and the interaction of testing and treatment.</p> <p>The researcher is also able to examine the combined effect of maturation and history by comparing, (the post-test only control group) and (the pre-test control group).</p>	<p>It is expensive because of the number of participants needed.</p> <p>There is difficulty in introducing the treatment simultaneously for all groups.</p>	No, participants are not randomly assigned to 4 groups.

**Table 1. Experimental design types considered.**

The experimental design in this study typifies a repeated measures approach whereby the first viral video stimulus was hypothesised to elicit mainly surprise whilst the second was happiness (Positive emotions). The first video depicted a wonderfully

struck long-range strike from the centre of the football field reminiscent of strikes from more renowned professional footballers. The second video depicted Manchester United players acting for a pre-release trailer for a movie – “Independence Day Resurgence”. The first and second video were chosen due to their widespread circulation – (Video 1 harnessing 64, 476 views and 142 shares; Video 2 harnessing 257,757 views and 326 shares) and hypothesised ability to induce a measurable variation in the mean emotional intensities. The main variables measured using the facial expression analysis study were the mean emotion intensities of each participant as well as the valence and the arousal.

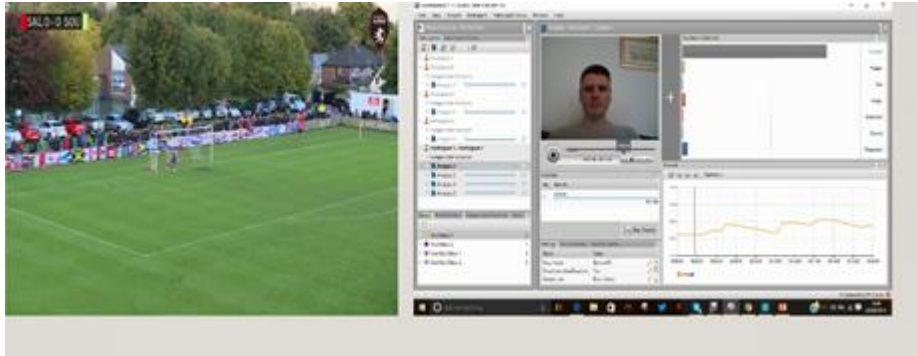
## **2.4 Procedure**

On site participants were required to read a participation information sheet and sign an ethical approval form prior to the start of the study. The participant information sheet depicted the entire process they will go through as well as the scope behind the study. Remote participants had to do likewise and check an online web form that stated that they agree with the modus operandi. Participants who took the study remotely were instructed to record themselves with any suitable recording software and a high definition webcam, onsite participants had access to a testing suite, a laptop using the Face Reader 6 software and webcam. To organise the data and analyse the results a statistical tool - SPSS - was used for advanced inferential statistical analysis.

### **2.4.1 Facial Expression Analysis**

Facial expression instruments are based on theories that link expression features to distinct emotions. Examples of such theories are the Facial Action Coding System (Ekman and Friesen, 1978), and the Maximally Discriminative Facial Moving Coding System. Generally, visible expressions captured on stills or short video sequences are analysed. An example is the Facial Expression Analysis Tool. According to Loannou et al., (2005) Facial features and expressions are critical to everyday communication. Besides speaker recognition, face assists several cognitive tasks: for example, the shape and motion of lips forming visemes can contribute greatly to speech comprehension in a noisy environment. While intuition may imply otherwise, social psychology research has shown that conveying messages in meaningful conversations can be dominated by facial expressions, and not spoken words. This result has led to renewed interest in detecting and analysing facial expressions in not just extreme situations, but also in everyday human–human discourse. A very important requirement for facial expression recognition is that all processes therein must be performed without or with the least possible user intervention. This typically involves initial detection of face, extraction and tracking of relevant facial information, and facial expression classification.

Benta et al. (2004) described FaceReader as a system for fully automatic real time facial expression analysis developed by VicarVision and commercially available since 2007. It is currently used worldwide for numerous (consumer) behaviour studies. The software tool can process still images, video and live camera feeds and produces approximately 15 analysis results per second on a modern PC, allowing it to be used in real-time. FaceReader can classify expressions corresponding to one of the 6 basic emotions as defined by Ekman plus neutral and classifies the emotional valence of the expression and some personal characteristics like gender, age and ethnicity.



**Figure 2. FaceReader 6 software measuring participants' emotionality.**

### **2.4.2 Self – Report (Online web Questionnaire Survey)**

In a web- based questionnaire the researcher places a question on the web and respondents are asked to complete and submit it electronically. Oates (2006); Saunders et al., (2003) identify the advantages of deploying an online based questionnaire as the following:

- Data obtained can come from many people in different part of the globe.
- Visitors to a website could be asked to complete an online questionnaire.
- Respondents can answer easily and quickly (Saunders et al.,2003)
- Audio and video can be embedded in a web questionnaire (The use of video was pivotal to the study).



**Figure 3. Online Web Questionnaire.**

### **2.5 Evaluation (Concurrent Validation)**

Salkind (2010) explains that results of a concurrent validation study are typically evaluated in one of two ways which is determined by the level of measurement of the scores from the two measures. When the scores on both the new measure and the criterion measure are continuous, the degree of concurrent validity is established via a correlation coefficient. Cohen and Swerdlik (2009) elucidate that the validity coefficient is a correlation coefficient that provides a measure of the relationship between test scores and scores on the criterion measure. The concurrent validity of the test (i.e. facial expression analysis in this study) is explored with respect to another test (i.e. questionnaire survey). In this case, prior research has satisfactorily demonstrated

the validity of the use of the facial expression analysis Benta et al. (2004); Terzis, Morides and Economides (2010), so the question becomes: “How well does facial expression analysis compare with a questionnaire survey?” Here, Test B (i.e. questionnaire survey) is used as the **validating criterion**.

Thus, to test if the methods corroborate each other (i.e. observation data from facial expression analysis and questionnaire survey) it was integral to cross-validate using a spearman’s correlation to test the methods in relation to the basic emotions represented. Ostensibly, the data shows the significant correlations from the tests undertaken based on the hypothesis that:

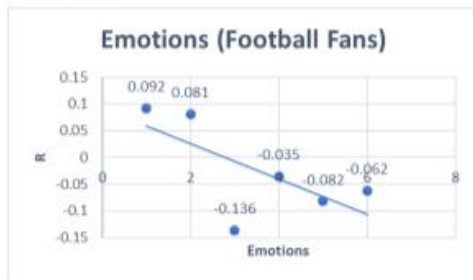
**H1: There is a strong positive correlation between emotions data obtained from facial expression analysis and survey data among Football fans.**

### 3.0 Results

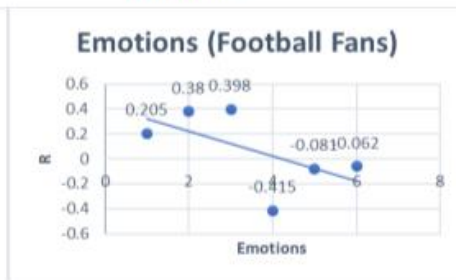
There are two main implications of undertaking the validity test i.e. where both methods are right and thus show mutual association for the emotions or one method is right, and the other less effective to be used in a research study. The initial results have shown that there exists minimal relationship between the two methods (i.e. existence of discriminant validity which tests whether measurements that are not supposed to be related are unrelated). The results have indicated only three significant results (anger, surprise and sadness) out of 24 tests where  $r(31) = -0.398, p = 0.027, p < 0.05$ ;  $r(31) = 0.081, p = 0.035, p < 0.05$  and  $r(31) = -0.415, p = 0.020, p > 0.05$ . A summary of the validity coefficient indicates that the methods were correlated for only viral video 2 when measuring surprise, anger and sadness in football fans. Sadness indicated a negative correlation which is ambiguous within the scope of the study. In contrast the same video when comparing the emotion of anger in non-football fans also indicates that there is no correlation between the two methods. A further insight into the tests show that the results were significant at a 95% confidence significance level which will support the argument that the likelihood of the significance occurred by chance as opposed to if it had occurred at a more robust confidence level of 99%. *The significance of the results is that self-report cannot (i.e. validating criterion) cannot be used to measure emotions or be used synchronously with facial expression analysis to reach the same conclusion from their corresponding datasets.* More so, it has been established from prior studies that the facial expression analysis software is more effective method for measuring emotions on its own merit (Terzis, Morides and Economides, 2010; Danner et al., 2013) and supersedes that of a questionnaire survey when used collectively (Zaman and Smith, 2006). The scatter plot diagrams below show further evidence of discriminant validity where an inverse relation is shown between the two methods depicted by a negative downward slope.

## R-Coefficient Data (Emotions)

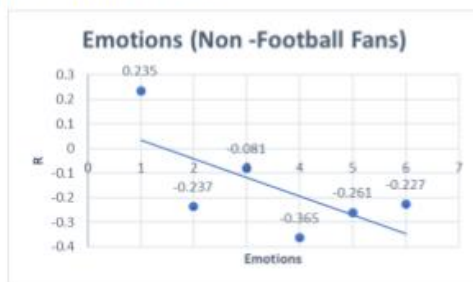
### Viral Video 1



### Viral Video 2



### Non - Viral Video 1



### Non - Viral Video 2

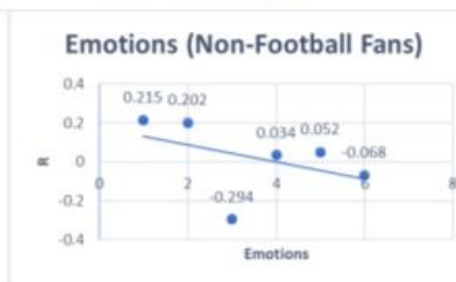


Figure 4. R-Coefficient values.

## 3.1 Conclusions

To support the premise from this research that the validating criterion (i.e. questionnaire) is not an effective method for measuring emotions it will be important to assess the study undertaken by Harley (2015) who also evaluated different methods in measuring emotions. Harley (2015) noted that Self-report measures (i.e. questionnaires) is the most widely used method to measure emotions and are based on participants' self-reported (perceived) experience of emotions, rather than behavioural or physiological emotional information. Although self-reports are flexible regarding when they can be administered (e.g., before, during, or after a learning session) they are, strictly speaking, offline measures because participants are interrupted, and their attention is redirected from the emotion eliciting stimuli.

Harley (2015) explained that although self-reports are ubiquitous in educational, cognitive, and social psychology research, there are many well-known shortcomings with this method that are relevant to measuring emotions. One of the major shortcomings is asking a participant to rate their perception of having experienced an emotion. As such, the accuracy of one's self-reported emotional state can be undermined by the following: (1) never having experienced that particular emotion; (2) being unable to accurately remember an instance of a particular emotion; (3) having a different meaning or understanding (than the researcher) associated with the emotional term or label; (4) being reticent to espouse the experience of negative emotions during their interaction with the video stimulus due to social desirability; (5) time span between experiencing a particular emotions and being asked to report the emotion; or (6) the self-report measure eliciting a different emotion (e.g., boredom) than that experienced prior to its administration. Given the potential for self-report measures to influence the emotions they purport to assess, and the unique influence of self-report measures on emotions relative to other psychological states and processes as measured by self-

reports measures. The research showed that self-reports are inadequate to solely elicit and gain a comprehensive understanding of one's subjective thoughts and other methods will need to be utilised. To cite an example, during one of the tasks a participant verbally indicated that he was disgusted to see Wayne Rooney (Ex-Manchester United Player) and other Manchester United Stars and even though he was an Arsenal football fan and liked the movie trailer video he will not share it due to the dislike of the team, whilst another participant (Liverpool FC fan) felt the ties Salford City Football Club had to Manchester United through the class of 92 was an enough put off not to share the video even though the video was amusing, it was just not the type of content that will be shared but may verbally "tell" others about it. It appears, therefore, that the mechanisms driving viral content are not isolated to the online environment.

Harley (2015) depicted that in response to the various drawbacks of self-report measures, there are several steps that researchers can take to address some of these issues such as providing definitions for the emotions and emotional terms participants are asked to use in reporting their emotional experiences. While definitions of emotions may differ between researchers, this approach makes the researchers' and participants' operationalisation of emotions more transparent. Additionally, researchers can administer self-report measures while participants are interacting with the video stimulus to reduce the likelihood that they will not accurately remember the emotions they were experiencing (*This was offset in this research as a web questionnaire embedded with video stimulus was used*). Accuracy of recall for retrospective self-report questionnaires may also be improved by showing learners footage of their learning session and facial responses during the session. Finally, to decrease item fatigue and the possibility of negative emotions, researchers can also use single-item questions to assess emotions.

### **3.2 Future Work**

The future study proposes to take an in-depth look at the Emotional Retrospective Think Aloud (ERTA) method in conjunction with facial expression analysis. The ERTA emotion measures feeling where users are asked to elicit the emotions in words when a video is usually replayed after an eye tracking session (Petrie and Precious,2010). The additional qualitative approach will provide insight that cannot be captured by facial expression analysis and self-report with an additional focus on the nuances of "why"?

### **References**

- Adage.com. (2015). *Walmart Crushes Holiday Video Views, but One Bona Fide Spiritual Message Gets Through Too*. [online] Available at: <http://adage.com/article/advertising/holiday-viral-campaigns-2015/301853/> [Accessed 28 Jul. 2016].
- Bampo, M., Ewing, M. T., Mather, D. R., Stewart, D., and Wallace, M. (2008). The Effects of the Social Structure of Digital Networks on Viral Marketing Performance. *Information Systems Research*, 19(3), 273–290. doi:10.1287/isre.1070.0152.

- Bența, K., Kuilenburg, H., Xolocotzin Eligio, U. and den Uy, M. (2009). Evaluation of a System for Real-Time Valence Assessment of Spontaneous Facial Expressions. Cluj-Napoca: International Romanian – French Workshop.
- Berger, J. (2013). *Contagious why things catch on*. New York: Simon and Schuster, pp.21-27.
- Berger, J. and Milkman, K. (2012). What Makes Online Content Viral?. *Journal of Marketing Research*, 49(2), pp.192-205.
- Christophe V. and Rimé B. (1997). Exposure to the social sharing of emotion: emotional impact, listener responses and the secondary social sharing, *European journal of social psychology*, 27, 37–54.
- Chu, S. C. (2011). Viral advertising in social media: participation in Facebook Groups and Responses among college-Aged users. *Journal of Interactive Advertising*, 12(1), 30.
- CIRT (2018). *Types of Experimental Research Designs - Center for Innovation in Research and Teaching*. [online] Available at: [https://cirt.gcu.edu/research/developmentresources/research\\_ready/experimental/design\\_types](https://cirt.gcu.edu/research/developmentresources/research_ready/experimental/design_types) [Accessed 31 May 2018].
- Cohen, R. J., and Swerdlik, M. E. (2009). *Psychological testing and assessment: An introduction to tests and measurement* (7th ed.). New York, NY: McGraw-Hill.
- Danner, L., Sidorkina, L., Joechl, M. and Duerrschmid, K. (2014). Make a face! Implicit and explicit measurement of facial expressions elicited by orange juices using face reading technology. *Food Quality and Preference*, 32, pp.167-172.
- Dobele, A., Lindgreen, A., Beverland, M., Vanhamme, J. and van Wijk, R. (2007). Why pass on viral messages? Because they connect emotionally. *Business Horizons*, 50(4), pp.291-304.
- Ekman, P., and Friesen, W. V. (1978). *The Facial Action Coding System*. Palo Alto, CA: Consulting Psychological Press.
- Feder, Y. (2014). *Social Network 301: What is Virality?* [online] LinkedIn.com. Available at: <https://www.linkedin.com/pulse/20140918141439-7859692-social-network-301-what-is-virality> [Accessed 12 Oct. 2016].
- Feroz Khan, G. and Vong, S. (2014). Virality over YouTube: an empirical analysis. *Internet Research*, 24(5), pp.629-647.

- Guadagno, R., Rempala, D., Murphy, S. and Okdie, B. (2013). What makes a video go viral? An analysis of emotional contagion and Internet memes. *Computers in Human Behavior*, 29(6), pp.2312-2319.
- Godes D, Mayzlin D, Chen Y, Das S, Dellarocas C, Pfeiffer B, Libai B, Sen S, Shi M, Verlegh P (2005). The firm's management of social interactions. Mark Lett.
- Harley, J. M. (2015). Measuring emotions: A survey of cutting-edge methodologies used in computer-based learning environment research. In S. Tettegah & M. Gartmeier (Eds.). *Emotions, Technology, Design, and Learning* (pp. 89-114). London, UK: Academic Press, Elsevier.
- Jiang, L., Miao, Y., Yang, Y., Lan, Z. and G. Hauptman, A. (2014). Viral Video Style: A Closer Look at Viral Videos on YouTube. In: *ICMR*. Glasgow: ACM.
- Keane, M. (2010). The secret to viral video success: a big ad budget. [online] Econsultancy. Available at: <https://econsultancy.com/blog/6557-the-secret-to-going-viral-a-big-ad-budget> [Accessed 28 Mar. 2018].
- Kuilenberg, H., Wiering, M. and Uyl, M. (2005). A Model Based Method for Automatic Facial Expression Recognition. In: *16th European Conference on Machine Learning*. Porto: Machine Learning: ECML 2005
- Lagger, C., Lux, M., & Marques, O. (2011). What makes people watch online videos: An exploratory study. *ACM Computers in Entertainment*, (May 7-12). doi:978-1-4503-0268-5/11/05.
- Ioannou, S., Raouzaiou, A., Tzouvaras, V., Mailis, T., Karpouzis, K. and Kollias, S. (2005). Emotion recognition through facial expression analysis based on a neurofuzzy network. *Neural Networks*, 18(4), pp.423-435.
- McLeod, S. A. (2013). What is validity? [www.simplypsychology.org/validity.html](http://www.simplypsychology.org/validity.html)
- Nelson-Field, K., Riebe, E. and Newstead, K. (2013). The emotions that drive viral video. *Australasian Marketing Journal (AMJ)*, 21(4), pp.205-211.
- Nudd, T. (2015). *The 20 Most Viral Ads of 2015*. [online] AdWeek. Available at: <http://www.adweek.com/news-gallery/advertising-branding/20-most-viral-ads-2015-168213> [Accessed 28 Jul. 2016].
- Oates, B. (2006). *Researching information systems and computing*. Los Angeles: Sage.
- Porter, Lance and Guy J. Golan (2006), "From Subservient Chickens to Brawny Men: A Comparison of Viral Advertising to Television Advertising," *Journal of Interactive Advertising*, 6 (2), 30–38.



- Rime, B. (2009). Emotion Elicits the Social Sharing of Emotion: Theory and Empirical Review. *Emotion Review*, 1(1), pp.60-85.
- Southgate, D., Westoby, N. and Page, G. (2010). Creative determinants of viral video viewing. *International Journal of Advertising*, 29(3), p.349.
- Roy, S. S. (2011). Exploring the propensity to share product information on social networks (Masters). School of Journalism and Mass Communication, The University of Minnesota, Minnesota. Retrieved from [http://conservancy.umn.edu/bitstream/117151/1/Sen%20Roy\\_Sahana\\_August2011.pdf](http://conservancy.umn.edu/bitstream/117151/1/Sen%20Roy_Sahana_August2011.pdf).
- Salkind, N. (2006). *Exploring research*. Upper Saddle River, N.J.: Pearson Prentice Hall.
- Salganik, M. J., Dodds, P. S., and Watts, D. J. (2006). Experimental study of inequality and unpredictability in an artificial culture market. *Science*, 311, 854–856.
- Stets, J. and Burke, P. (2000). Identity Theory and Social Identity Theory. *Social Psychology Quarterly*, 63(3), p.224.
- Saunders, M., Lewis, P. and Thornhill, A. (2003). *Research methods for business students*. Harlow, England: Prentice Hall.
- Teixeira, Thales S., Michel Wedel, and Rik Pieters. "Emotion-induced Engagement in Internet Video Ads." *Journal of Marketing Research (JMR)* 49, no. 2 (April 2012): 144–159.
- Terzis, V., Moridis, C. and Economides, A. (2011). Measuring instant emotions based on facial expressions during computer-based assessment. *Pers Ubiquit Comput*, 17(1), pp.43-52.
- Trepte, S. (2006). Social Identity Theory. In J. Bryant & P. Vorderer (Eds.), *Psychology of entertainment* (pp. 255-271). Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.
- Wagner, U., Galli, L., Schott, B., Wold, A., van der Schalk, J., Manstead, A., Scherer, K. and Walter, H. (2014). Beautiful friendship: Social sharing of emotions improves subjective feelings and activates the neural reward circuitry. *Social Cognitive and Affective Neuroscience*, 10(6), pp.801-808.
- Watts, Duncan J. and Jonah Peretti (2007), "Viral Marketing for the Real World," *Harvard Business Review*, 85 (5), 22–23.

Zaman, B. and Shrimpton-Smith, T. (2006). The FaceReader: Measuring instant fun of use. In: Proceedings of the fourth Nordic Conference on Human-Computer Interaction pages:457-460. [online] Oslo: ACM Press, pp.457-460.