Communication Studies

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/rcst20

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To cite this article: Alyce Viens & Kirstie M. Farrar (2021) Conceptualizing and Measuring Binge Watching, Communication Studies, 72:3, 267-284, DOI: 10.1080/10510974.2021.1876748

To link to this article: https://doi.org/10.1080/10510974.2021.1876748

Published online: 31 Jan 2021.

COMMUNICATION STUDIES
2021, VOL. 72, NO. 3, 267–284
https://doi.org/10.1080/10510974.2021.1876748

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Conceptualizing and Measuring Binge Watching

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ABSTRACT

Binge watching has risen in popularity, and thus is receiving increasing scholarly attention. Across the limited range of studies that have been conducted, there is a lack of uniform conceptualization and empirical measurement of binge watching making generalizability and theoretical development across studies challenging. This investigation provides an overview of current binge watching conceptualization and operationalization, and presents initial testing of two measures of binge watching for both general binge watching behavior, and single-program binge watching.

KEYWORDS

Marathoning; viewing behavior; heavy viewing; scale development; binging; media effect

Binge watching has become increasingly popular in recent years with the expansion of digital streaming services. Companies such as Netflix and Hulu have pioneered digital streaming, allowing viewers to fully immerse themselves in seemingly endless hours of readily available content. Although the behavior itself is popular, research on binge watching is still developing. One such line of research is an attempt to determine how to define binge watching, as definitions have varied and there has yet to be consensus on how to fully define binge watching (Ferchaud, 2018; Starosta & Izydorczyk, 2020; Vaterlaus et al., 2019). As a result, binge watching research currently lacks consistent conceptualization and validated empirical measurement tools to accurately and reliably capture the behavior among viewers. Having an established conceptualization and measurement tool will allow for consistency across studies and facilitate a better understanding of binge watching across contexts and populations. The purpose of this study is to describe previous conceptualizations of binge watching and present initial tests of two binge watching measures, one for general binge watching behavior, and one for single-program binge watching.

Binge Watching as a (Relatively) New Phenomenon

Binge watching, binge viewing, or marathon viewing, is not an entirely new behavior among audiences as television program marathons, as well as DVD sets for purchase, have been present for at least a few decades (Feeney, 2014). The current phenomena of binge watching is the direct result of online streaming services, making this viewing style more accessible and flexible. In the United States, approximately 80% of consumers are now subscribed to at least one streaming service (Westcott et al., 2020) and significant amounts of binge watching occurs. More than half of adults under the age of 45 subscribed to a streaming service

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have reported binge watching, and binge watching is reportedly as high as 70% of viewers for consumers aged 18–44 (Acklin, 2020).

What differentiates binge watching from traditional television viewing? One difference is the consumption of multiple episodes of the same program during the same sitting, rather than watching a variety of programs as may occur with traditional viewing or heavy viewing. Streaming services facilitate the ability to watch multiple episodes of the same show on demand. In addition, while traditional television consumption, or serial watching of a show, only allows viewers to watch one episode per week as it is released, binge watching allows for the immediate viewing of multiple episodes, sometimes even an entire season or series. This flexibility is appreciated by viewers as a Harris Interactive research study found that 76% of participants responded that streaming, a common means of binge watching, was their preferred method of television consumption because of the flexibility it enabled (Netflix Media Center, 2013). It reflects the Internet's overall flexibility in allowing for interactivity, de-massification, and asynchronicity, effectively giving the consumer more control, choice, and scheduling options (Ruggiero, 2000).

However, there is some ambiguity as to what constitutes a "binge." Some have kept the definition broad in that it refers to watching multiple or several episodes of the same program in one sitting (Exelmans & Van den Bulck, 2017; Flayelle et al., 2019; Merikivi et al., 2018). Others have been more specific and defined binge watching as consuming two or more episodes in one sitting (Netflix Media Center, 2013; Pittman & Sheehan, 2015; Walton-Pattison et al., 2018), or as three or more episodes per sitting (Schweidel & Moe, 2016; Tukachinsky & Eyal, 2018). Clearly a more consistent definition is needed to draw conclusions across bodies of research.

It is also important to gain a better understanding of the implications of binge watching for effects, as it continues to gain in popularity. Research on the effects of heavy television viewing have already been studied, especially in consideration of cultivation effects (see Morgan, 2009; Morgan et al., 2009). Binge watching research is still emerging but preliminary studies have surfaced in which binge watching specifically is the central focus, attempting to determine both antecedents and effects of binge watching (e.g., Exelmans & Van den Bulck, 2017; Pittman & Sheehan, 2015; Shim & Kim, 2018; Shim et al., 2018; Sung et al., 2018; Tukachinsky & Eyal, 2018; Viens & Farrar, 2018; Walton-Pattison et al., 2018). We now turn to a more thorough explication of the current state of binge watching measurement.

The Current State of Binge Watching Measurement

As mentioned, much of this early research is being conducted without a consistent definition and conceptualization or measure. Researchers are employing diverse methodologies in defining and measuring binge watching and thus may not be capturing the same behavior due to the lack of consistency. This makes it challenging to draw firm conclusions about the implications of binge watching.

The inconsistency is evident when examining the various methodologies that have been utilized in self-report studies thus far. A search for self-report methodology studies in which binge watching was measured was conducted in Google Scholar, Communication and Mass Media Complete, and ProQuest Dissertations Publishing database. Dissertation research was included because of the lack of published studies on binge watching, which speaks to

the current state of the research. A total of 27 self-report method studies were examined. Some studies explicitly defined binge watching for participants, and/or set a specific number of episodes for participants to indicate if they had binge watched. Of these studies, four did so under the parameters of watching two or more episodes in the same sitting (Eastin et al., 2018; Pittman & Sheehan, 2015; Sung et al., 2018; Walton-Pattison et al., 2018), and eight studies did so under three or more episodes per sitting (Dickinson, 2014; Eden et al., 2018; De Feijter et al., 2016; Ferguson et al., 2018; Merrill Jr. & Rubenking, 2019; Pittman & Steiner, 2019; Riddle et al., 2018; Rubenking & Bracken, 2018). Within these 12 studies, some used binary measures where participants agreed or disagreed if they had binge watched or not. Other measures asked for the amount of hours spent binge watching under the given parameters, or the number of days spent binge watching as defined.

Another methodology identified in these studies were ordinal or categorical measures where participants were asked how frequently they binge watched on scales from never to once a day (Warren, 2016), or were classified by the number of shows that they have binge watched (Pena, 2015). One study attempted to quantify binge watching for analysis by measuring it according to the amount of time it took to complete a program (Dyche, 2017); others asked how many hours, episodes, or viewing period frequencies over a specified period of time did participants watch the same program (Exelmans & Van den Bulck, 2017; Jacobs, 2017). One study quantified binge watching by the number of episodes of a program consumed divided by the number of days watched (Walter et al., 2018). Another based binge watching on the amount of hours watched of a program (Gray, 2018). Finally, within this grouping several studies measured binge watching using categorical means in which participants were presented options to choose from based on scheduling (i.e. watched shows week to week, old reruns) and the method of viewing (i.e. DVR, DVD sets) (Conlin, 2015; Conlin et al., 2016; Tefertiller & Maxwell, 2018).

The final grouping of studies attempted to create measures in order to capture binge watching. Two studies used a similar method in which participants were asked with interval scales to rate their agreement with their tendencies to watch multiple episodes of a program in one sitting, to watch episodes of a program as quickly as possible, and if they sometimes happen to binge watch a program (Shim & Kim, 2018; Shim et al., 2018); however, the reliabilities on these studies were relatively low (α = .67, .63, respectively). An additional study had a more reliable measurement (α = .87), but the measure itself directly used the terminology of binge watching, and did not undergo any validation procedures (Granow et al., 2018). One study measured binge watching by taking the product of the number of consecutive days watched and the average episodes per day in the participant's most recent instance of marathon viewing; however, the authors report that this measure was not normally distributed (Tukachinsky & Eyal, 2018). Finally, Flayelle et al. (2019) developed their Binge-Watching Engagement and Symptoms Questionnaire (BWESQ). This seven-factor scale serves as a measure of the symptoms associated with binge watching, rather than measuring the behavior of binge watching itself. The BWESQ includes factors such as engagement and positive emotion. Although this scale does provide researchers with a tool to measure variables associated with binge watching, the scale itself does not measure the actual behavior of binge watching. Rather, the BWESQ measures outcomes associated with the behavior of binge watching.

The variability in the methods and definitions used in the above work does raise some concerns when trying to draw conclusions across studies. For example, studying binge

watching by using a specified number of episodes is problematic as there is no consensus on how many episodes actually constitutes a "binge." Some claim that anything more than one episode consumed in one sitting would be binge watching (Pittman & Sheehan, 2015), while some leave it ambiguous as "multiple" (Exelmans & Van den Bulck, 2017). By directly specifying a particular number of episodes, we potentially exclude some individuals who may be binge watching and we may not be capturing what the general public considers binge watching. It may be the case that binge watching is a subjective experience in which one person may view three episodes as a binge, while another may not. Thus, researchers need to take care to properly define the behavior for participants and to base this on an agreed upon definition of the phenomenon. It is also important to note that episodes vary in length based on the program itself, making specific quantifications of episode parameters a challenge as watching three half-hour episodes in a row is not quite the same time commitment or experience as watching three hour-long episodes.

Additionally, we must consider that there is a negative connotation with the word "binge," as it often refers to dangerous drinking or unhealthy eating behaviors. The word "binge" is defined as, "an act of excessive or compulsive consumption (Merriam-Webster, n.d.), or "a period of excessive indulgence in an activity" (Oxford, n.d.). It is not yet fully understood how people perceive binge watching, and whether the same negative associations seen with other binge behaviors exists. Research by Ferchaud (2018) indicated that nearly one-quarter of participants evaluated the valence of the term "binge watching" as wholly negative, compared to only 8.3% evaluating the term as wholly positive, with others finding the term to be neither positive nor negative. An examination of how journalists have framed binge watching yields interesting results as well. A comprehensive look at newspaper articles about binge watching since its introduction by Pierce-Grove (2017) reveals that journalists have often framed binge watching in a negative way, claiming that it wastes time, hurts social life, and ultimately can reflect sacrificing life for screen time. If the general public is exposed to a narrative in which binge watching can be viewed as a behavior to feel guilt over, that must be considered in the collection of data. As a result, it may be problematic to use the label "binge watching" when asking participants to self-report as there is a potential for underestimation or misreporting due to a social desirability bias. Participants may not be willing to admit just how much they binge watch if they believe the behavior carries a negative connotation.

Simply asking participants the number of days they engaged in binge watching, or the frequency with which they binged also raises concerns. For example, there have been critiques of measuring television viewing using a similar post-hoc assessment of hours watched in a day as it may be subject to a significant degree of error (Gunter, 2012; Potter, 2008). More precise measures of television viewing add to the specificity and range of analysis possible (Morgan, 2009). By measuring binge watching using a post-hoc assessment, we are presented with the same potential for measurement error; not only do we limit ourselves in the sophistication of our analyses, we run the risk of reporting error.

Further, it is noteworthy that binge watching is being classified as a singular construct for measurement, but there are different types of binge watching that were present in the studies examined. While some studies attempted to measure binge watching as a pattern of behavior for individuals, similar to how heavy television viewers are defined, others were measuring the extent to which only one specific program was binge watched. These

represent two different types of binge watching and having only one measure to capture both could lead to inaccuracies in terms of the conclusions drawn across studies.

Clearly there is a good deal of inconsistency in how binge watching is both defined and measured in the literature and this may account for some of the disparity in findings across studies. For example, some research has attempted to examine the relationship between binge watching and audience involvement with both the characters and narrative of a television program. However, these studies are employing different methodologies and definitions of the behavior. This inconsistency could explain some of the disparity in findings across these studies, such as the impact of binge watching on involvement variables where some studies have found support, and others have not (Dyche, 2017; Tukachinsky & Eyal, 2018; Viens & Farrar, 2018). Binge watching scholarship needs consistent measurement so that we may begin to draw conclusions across bodies of research while enabling theoretical development in this area.

One way to move the research forward is to develop an interval measure of binge watching to better capture the behavior and determine its relationships with other variables of interest. The variability in methods present in the current literature makes generalizability or the development of theoretical frameworks across studies challenging. It is thus the intention of this research to develop and test two measures of binge watching to enable scholarship to move forward with uniform measurement tools to facilitate generalizability and theoretical development. We begin with a conceptualization of binge watching and describe how the two scales for this research were developed.

Conceptualizing Binge Watching

For the purposes of developing measurement for binge watching behavior, we define binge watching as viewing multiple episodes of the same program or series in the same sitting with varying levels of intentionality. Although this can apply to both television programming marathons as well as movie series marathons, provided they are consumed in the same viewing session, our intention is to explore the need for empirical measurement for binge watching of television programs only. This research does not seek to quantify binge watching by a specific number of episodes as we do not feel this is advantageous to the advancement of binge watching research. For example, designating a specific number of episodes to be considered binge watching is problematic as episodes vary in length. There is not enough information to make a claim that viewing two episodes of a twenty-minute program is the same as viewing two episodes of a sixty-minute program. In addition, binge watching may be somewhat of a subjective experience for the individual viewer (Ferchaud, 2018; Jenner, 2017). While some may consider viewing two episodes in one sitting a binge, others may do so on a regular basis and thus have a higher threshold for feeling as though they are binge watching. For these reasons, we do not find it advantageous to specify a specific number of episodes, but rather to keep the definition to multiple episodes to be inclusive of all types of binge watching behaviors.

An additional characteristic present in binge watching is that it instills a greater sense of control for the viewer. VCRs, DVDs, time-shifting technologies, and streaming video-on-demand services have allowed viewers over time to have greater control over their viewing schedules. Traditionally on television, there was a set schedule for new episodes to premiere, often once a week until a new season was complete. In contrast, these new platforms and

time-shifting technologies offer viewers access to multiple episodes of programs that can be consumed on their preferred schedule. Multiple episodes can be consumed in single sittings, or multiple times per week if the viewer chooses. Schweidel and Moe (2016) have even gone so far as to include multiple viewing sessions in a short period of time as part of their classification of binge watching. Many viewers have noted that they prefer streaming specifically because of the flexibility in scheduling and access that it enables (Netflix Media Center, 2013). Platforms such as Netflix are seemingly designed for binge watching as it requires more effort to stop watching a program than allowing it to automatically continue (Pittman & Sheehan, 2015). For example, the next episode in Netflix will automatically begin a mere six seconds after the credits have finished on a program.

It is also important to consider that there may be varying levels of intentionality involved with binge watching. A person can intend to watch an entire season of a program in one day. In contrast, that person could also only intend to binge watch five episodes, but let time get away from them and watch an entire season. That person could also turn on the television and find a marathon of *Will & Grace* and watch it for five hours without any original intention of doing so. There is not yet enough information about how intentionality impacts antecedents or outcomes of binge watching, but this notion of impulsivity was something that we felt needed to be included. Impulsivity may be related to unintentional binge watching behavior as suggested (Riddle et al., 2018) and there has also been some concern over the addictive potential of binge watching (De Feijter et al., 2016; Devasagayam, 2014). Horvath (2004) in the conceptualization of television addiction included a component of unintended use of television in which sometimes viewers consume more than they ever intended to. Additionally, it has been qualitatively demonstrated that individuals recognize that they often binge watch in excess and have a difficult time with self-control, even when beginning a viewing experience with a specific episode intention (Flayelle et al., 2017). Excess and impulsivity have been demonstrated to be consistent with previous conceptualizations of binge watching (Ferchaud, 2018). The scales developed here recognize these varying levels of intentionality. It is clear that binge watching can sometimes occur with varying degrees of impulsivity and this needs to be considered when measuring this behavior.

Additionally, when developing these scales, the need for two separate measures emerged for measuring the intensity to which someone could be considered a "binge watcher" and a second measure to quantify the extent to which a particular program was binge watched. First, a general binge watching scale was necessary to measure overall binge watching behavior (regardless of program) and how this behavior may impact frequent binge watchers. For example, there have already been studies examining the relationship between binge watching and depression (Jacobs, 2017; Rutsch, 2015; Wheeler, 2015) or the effects on sleep (Exelmans & Van den Bulck, 2017). Second, an additional line of research has emerged in which the effects or outcomes of binge watching individual programs is examined, such as identification, parasocial relationships, or transportation (Tukachinsky & Eyal, 2018; Viens & Farrar, 2018) which necessitated the need for a single-program binge watching scale. This scale will allow data to be collected in which outcomes of specific program binge watching can be measured against variables of interest such as involvement, aggression, and various other outcomes. The difference between these two scales rests in the classification of the consumption itself. The general binge watching scale intends to measure a pattern of continued behavior regardless of program title, such that we may be able to classify

someone as a "binge watcher." The single-program binge watching scale, however, measures the binge watching of an individual program for use in studies on single-program binge watching research. The single-program scale does not seek to classify a person as a regular binge watcher, but rather measure the extent to which he or she binge watched an individual program to test against the outcomes that might result.

The development of these scales began with the testing of items for a general binge watching measurement tool. Upon determining an appropriate factor structure, the scale was adapted to measure binge watching of a single program. Each scale was subjected to tests of reliability and validity as detailed below.

Sample One Method

The data for the development of the General Binge Watching Scale (GBWS) were collected as part of a larger online survey through Qualtrics software. The study was announced in an undergraduate introductory communication course at a public Northeastern U.S. university, and students received course credit upon completion. After reading and agreeing to a study information sheet, participants were navigated to the online survey which took approximately 30 minutes to complete. The university's Institutional Review Board approved all procedures.

Participants

Given the length of the survey, along with past experiences showing the need for attention checks with this student sample, we implemented several attention checks. Participants were deleted if they failed any of the attention checks or if they failed to complete the survey. The initial sample size was $N = 411$, and 133 participants were deleted for incomplete responses or failed attention checks, making the final sample size $N = 278$.

Participants ranged in age from 18 to 41 years with an average age of 19.2 ($SD = 1.81$) years. The sample was approximately 60% female ($n = 167$), 71% Caucasian ($n = 197$), 15% Asian/Pacific Islander ($n = 42$), 7% Hispanic/Latino ($n = 19$), 4% African American/Black ($n = 12$), and the remainder identified as other or preferred not to answer ($n = 8$).

Measures

In addition to the development of the scale[1], the following measures were used for validation purposes.

Overall Television Viewing

Overall television viewing was computed by asking participants to indicate the number of hours of television they watch in each day of a typical week. The hours were summed to create a measure of hours per week ($M = 12.35$, $SD = 11.23$).

Television Addiction

Television addiction was measured using Horvath's (2004) Television Addiction Scale ($\alpha = .94$, $M = 1.68$, $SD = .66$), a 20-item measure with anchor points of 1 (*strongly disagree*) to 5 (*strongly agree*).

Binge Watching Attitudes

A measure of binge watching attitudes was created with a 5-item scale (α = .79, *M* = 2.98, *SD* = .76). Sample items included, "I like to binge watch my favorite shows" and "I think binge watching is a positive experience" and were answered on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Self-Reported Binge Watching

Participants were asked to self-report if they considered themselves to be a regular binge watcher, indicated by yes or no.

Scale Item Development

The purpose of this scale was to measure general binge-watching behavior to check against various outcomes (e.g., do people who binge watch programs frequently tend to have higher levels of depression), similar to how we might classify an individual as a heavy television viewer. To create this measure 20 items were initially developed that reflected binge-watching behavior.[1] To demonstrate content validity, the initial items were grouped into three categories that capture binge watching, per the current literature. The first category captures the fundamental definition of binge watching in that it involves watching more than one episode in the same sitting, which is something that the varying definitions of binge-watching share (e.g., Sung et al., 2018; Walton-Pattison et al., 2018). This was represented with items such as, "I watch multiple episodes of television programs in one sitting." The second category represented the scheduling aspect of binge watching (Pittman & Sheehan, 2015). One of the key features of traditional watching is that a viewer watches one episode of a show per week as it premieres on television. Binge watching enables viewers to watch several episodes at a time, as well as multiple times per week, allowing for great flexibility in scheduling. This category contained items such as, "I watch episodes of the same television program more than once per week." Finally, the last category of items attempted to capture the "binge" aspect of binge watching in that it is an impulse and happens in high doses, perhaps unintentionally (Riddle et al., 2018). Items such as "I find myself watching more episodes than I originally intended" attempted to quantify this behavior.

All items were measured on a five-point scale from 1 (*Not at all like me*) to 5 (*Very much like me*). Participants were asked to indicate how much each statement described themselves. An exploratory factor analysis (EFA) was performed using an unweighted least squares extraction and an oblimin rotation. An EFA was used because it is a more accurate representation of the latent structure of observed variables in a dataset than a principal components analysis (Park et al., 2002). An oblimin rotation was selected as the factors would likely be correlated. Eigenvalues were examined and two factors emerged that accounted for 43.09% of the variance. Initially, four factors emerged, however, some factors did not capture binge watching when considered as individual factors as the items were reverse coded and seemed to be capturing more traditional serial viewing of television, and therefore were excluded from the scale (e.g., "I watch a single episode of TV programs once per week."). Thus, when considered as an individual factor, the items were not capturing the intended construct, but rather a more traditional appointment viewing of television shows.

Items were retained for a factor if the items had a primary loading of greater than 0.6, and secondary loadings below 0.4 on that factor to ensure distinct and unique factors (Costello & Osborne, 2005; Kaiser, 1974). When both factors were combined into one measure the

7-item scale was reliable overall (α = .89, *M* = 3.59, *SD* = .92). The first factor, represented 34.49% of the variance and captured binge watching in its fundamental definition of watching multiple episodes in one sitting, as well as consuming episodes of the same program more than once per week; this 3-item factor was also reliable (α = .81, *M* = 3.88, *SD* = 1.01).[1] The second factor, representing 8.6% of the variance, captured impulsive binge watching and consisted of 4 items. A fifth item was deleted because it lacked inter-item correlations with some other items in the scale. This factor represented the 'binge' aspect of binge watching in that it captured watching more than intended, as well as the sense of time getting away while watching; this factor was also reliable (α = .91, *M* = 3.42, *SD* = 1.05). All scale items had significant inter-item correlations.

To confirm the findings of the EFA, a confirmatory factor analysis was performed on the two factors. CFA provides a more conservative and restrictive test. By performing this test on the same sample we can bolster against possible methodological limitations of the EFA, and subsequently be more confident in the scale's ability to perform well on future CFA testing with different samples (Van Prooijen & Van Der Kloot, 2001). The CFA did support a good model fit for this scale (*CMIN/DF* = 2.24, *CFI* = .98, *RMSEA* = .07).

To demonstrate convergent validity, the scale and individual factors were subjected to comparison to the four other measures mentioned above. First, a bivariate correlation was conducted with the measure of overall television viewing. The composite measure demonstrated significant positive correlation with overall television viewing ($r = .40$, $p < .001$), as did the fundamental factor ($r = .37$, $p < .001$), and the impulsive factor ($r = .35$, $p < .001$). A person who is binge watching frequently would be watching more television, as was demonstrated. A second validation was calculated by comparing binge watching to the measure of television addiction. As binge watching involves multiple episode consumption without interruption, and potentially excessive usage, it should follow that someone who frequently engages in binge watching may also display television addiction tendencies, and previous research has supported that self-reported binge watching is correlated with television addiction (Karmakar et al., 2015). The composite measure was significantly positively correlated with addiction ($r = .40$, $p < .001$), as was the fundamental factor ($r = .29$, $p < .001$) and the impulsive factor ($r = .43$, $p < .001$). Additionally, there was a significant positive correlation between binge-watching attitudes and the composite binge-watching measure ($r = .48$, $p < .001$), the fundamental factor ($r = .43$, $p < .001$), and the impulsive factor ($r = .42$, $p < .001$). Those who viewed binge watching positively should be more likely to binge watch shows themselves, as was demonstrated. Finally, for predictive validity a comparison between those who were self-reported binge watchers and those who did not consider themselves to be binge watchers was examined. A one-way analysis of variance was conducted between this reporting of binge watching and the binge-watching measures. There were significant differences between the two groups on the composite measure (F (2, 272) = 43.16, $p < .001$, $\eta 2 = .24$) in that self-reported binge watchers ($M = 4.29$, $SD = .97$) scored significantly higher than those who did not self-report regularly binge watching ($M = 3.12$, $SD = .94$). The same relationships emerged with the fundamental factor (F (2, 274) = 34.07, $p < .001$, $\eta 2 = .20$); self-report binge watchers ($M = 4.47$, $SD = 1.04$) and self-reported non-binge watchers ($M = 3.40$, $SD = .98$), as well as the impulsive factor (F (2, 272) = 31.38, $p < .001$, $\eta 2 = .19$) with self-reported binge watchers ($M = 4.15$, $SD = 1.04$) scoring higher than those who did not consider themselves binge watchers ($M = 2.91$, $SD = 1.14$) These findings demonstrate that those who consider themselves to be regular

binge watchers are also scoring significantly higher on these measures than those who do not consider themselves to be binge watchers.

Overall, the GBWS appears to be both reliable and valid. The scale items when considered both as a unidimensional measure and as a multi-factor scale were reliable, and correlated positively with overall television viewing, television addiction and positive attitudes toward binge watching. Additionally, those who self-reported as regular binge watchers scored significantly higher than those who did not consider themselves to be regular binge watchers. The next stage in this research was to determine if the items and factor structure of the scale would fit with a second sample.

Sample Two Method

To provide further validation on the GBWS, an additional data collection was conducted in order to perform a CFA on a second sample.

Participants

Participants were recruited from an undergraduate introductory communication course at a public Northeastern U.S. university, and received course credit upon completion. After reading and agreeing to a study information sheet, participants were navigated to the online survey which took approximately 10 minutes to complete. The university's Institutional Review Board approved all procedures.

The sample size was $N = 392$. Participants ranged in age from 18 to 26 years with an average age of 19.2 ($SD = 1.28$) years. The sample was approximately 57% female ($n = 222$), 66% Caucasian ($n = 260$), 15% Asian/Pacific Islander ($n = 58$), 8% Hispanic/Latino ($n = 31$), 5% African American/Black ($n = 21$), and the remainder identified as other or preferred not to answer ($n = 22$).

Measures

Participants were asked to answer the seven-items from the final version of the GBWS developed from sample one.

Sample Two Results

First, a CFA was performed to confirm if the two-factor solution from sample one fit the second sample. Model fit diagnostics were examined and confirmed a good model fit for the GBWS (*CMIN/DF* = 4.89, *CFI* = .98, *RMSEA* = .10). Although a standard threshold for the root-mean-square error of approximation is generally no greater than .08, previous research demonstrates that a slightly higher RMSEA is still adequate provided other diagnostics are within the acceptable thresholds (Yu, 2002).

Cronbach's alpha tests of reliability were also examined for this sample with the composite measure ($\alpha = .92$) and individual factors of the GBWS (fundamental factor $\alpha = .86$; impulsive factor $\alpha = .92$), confirming reliability of the measure on the second sample.

After the successful development and testing of the GBWS, we turned to examining the behavior of single-program binge watching. There may be different predictors and outcomes related to single-program binge watching as compared to binge watching habitually. It may be that certain programs lend themselves to being binged or it may be that certain personality types might binge a particular program even when they do not generally engage in binge-watching behavior. Thus, the next stage in this research was to determine if the GBWS could be adapted to measure single-program binge watching.

Single-Program Binge-Watching Scale (SPBWS) Development

Because the behavior of someone who binge watches a multitude of shows in general, and someone who binge watches a single program is so similar, the GBWS was used as a model for the development of the single-program binge-watching scale (SPBWS). As suggested above, an adapted scale for single-program binge watching is necessary because of the demands of some emerging research in binge watching. While the GBWS serves to classify someone as a "binge watcher" in a similar way that we might categorize a person as a heavy television viewer, a single-program scale serves to measure the degree to which an individual program was binge watched. This may prove useful for studies looking at outcomes such as parasocial relationships or involvement that might be impacted by binge watching, for example. In fact, studies have emerged in which the level of binge watching is investigated along with involvement variables (Dyche, 2017; Tukachinsky & Eyal, 2018; Viens & Farrar, 2018). The SPBWS can serve to measure how binge watching of a single program might compare to watching in a more traditional way with time-separated episodes. The behaviors present in being a binge watcher in general, or only binge watching a specific program would be the same, justifying the adaptation of the GBWS to a single-program scale. A person watching multiple episodes of the same program in a single sitting would still be exhibiting the same behavior of multiple episode consumption in the same viewing period although they may do so for different reasons or with different outcomes.

With the demonstrated factor structure confirmed for the GBWS, items were adapted to reflect watching a single program instead. For example, instead of "I watch multiple episodes of television programs in one sitting," the item was adapted to "I watched multiple episodes of this program in one sitting." This was repeated for all of the items of the GBWS. All items were measured on a five-point scale from 1 (*Never*) to 5 (*Always)*. The change in the labeling of anchor points was made to better reflect single-program watching.

Sample Three Method

To confirm that the GBWS could be adapted to the SPBWS, these adapted items were tested on a third sample. The data for this sample were collected through Qualtrics software. Participants were recruited to the study through Mechanical Turk and were each paid a small monetary amount ($.03) for participation in the study. Although this is a low payment, it is common on MTurk and workers are often required to complete quality low-paid tasks before they can be eligible for higher paid work. A decision was made to use a more age-diverse sample to demonstrate generalizability across different age populations. After reading and agreeing to a study information sheet, participants were navigated to the online survey which took approximately 10 minutes to complete. The adapted items that

were used to form the SPBWS were administered. To answer the questions of the SPBWS, participants were asked to name a television program that they had recently watched and seen all current episodes of and answer the items with that program in mind. The university's Institutional Review Board approved all procedures.

Participants

The initial sample size was $N = 243$, and 44 responses were deleted for incomplete data or failed attention checks, making the final sample size $N = 199$. Attention checks (e.g., please select "disagree" for this item) were implemented for this sample to account for participants who may have gone through the survey quickly given the small compensation, a concern that can sometimes be present when using Mechanical Turk. Participants were also deleted if they did not complete the survey. Participants ranged in age from 18 to 74 years with an average age of 36.77 ($SD = 12.73$) years. The sample was approximately 59% female ($n = 117$), 64% Caucasian ($n = 127$), 15% Asian/Pacific Islander (n = 29), 8% African American/Black ($n = 16$), 7% Hispanic/Latino ($n = 13$), 2% Native American ($n = 4$), and the remainder identified as other or preferred not to answer ($n = 10$).

Measures

Binge Watching Attitudes

The same measure of binge-watching attitudes ($\alpha = .72$, $M = 3.29$, $SD = .78$) used in the first sample was used with this sample as well.

Self-Reported Binge Watching of a Specific Program

Participants were asked to self-report how often they had watched the named show for two or more episodes in one sitting with a one-item measure from 1(*never*) to 9 (*daily*) ($M = 4.23$, $SD = 1.99$). The decision was made to ask about two or more episodes as it represented the absolute minimum number of episodes that could possibly be considered as binge watching.

Sample Three Results

First, the items of the SPBWS were subjected to a confirmatory factor analysis to verify that the adapted items from the GBWS would be a sufficient model fit. The CFA confirmed that the adapted version fit (*CMIN/DF* = 2.08, *CFI* = .99, *RMSEA* = .07). One item was deleted from the second factor, "I usually watch this show for exactly as long as I had planned to watch," as its standardized regression coefficient was below an acceptable level and the item did not load strongly on the factor (at least .4 for a sample less than 450) (Cabrera-Nguyen, 2010; Wolf et al., 2013).i

The SPBWS composite measure of both factors was reliable ($\alpha = .88$, $M = 3.37$, $SD = 1.00$), as was the fundamental factor ($\alpha = .85$, $M = 3.47$, $SD = 1.10$), and the impulsive factor ($\alpha = .81$, $M = 3.26$, $SD = 1.10$). All items had significant inter-item correlations.

To demonstrate convergent validity the measures were analyzed with the binge-watching attitudes measure ($\alpha = .72$, $M = 3.29$, $SD = .78$). Positive attitudes toward binge watching were significantly positively related to the composite measure ($r = .38$, $p < .001$), as well as

the fundamental factor ($r = .45$, $p < .001$) and the impulsive factor ($r = .24$, $p < .01$). These results indicate that the SPBWS did correlate with binge-watching attitudes. Those who favored binge watching were also scoring higher on the SPBWS, as would be expected.

To demonstrate predictive validity of the SPBWS, three linear regressions were conducted to determine if the SPBWS was predictive of the frequency with which participants binge watched the program as indicated by how often they had watched two or more episodes of the program in one sitting. On the composite measure, the SPBWS was predictive of increased binge watching of the program ($R^2 = .48$, F (1, 195) = 179.91, $p < .001$, $\beta = .69$, $p < .001$). The fundamental factor was also predictive of binge-watching frequency ($R^2 = .52$, F (1, 197) = 209.97, $p < .001$, $\beta = .72$, $p < .001$), as was the impulsive factor ($R^2 = .29$, F (1, 195) = 81.21, $p < .001$, $\beta = .54$, $p < .001$). These findings demonstrate that the SPBWS was predictive of greater self-reported binge watching of the named program.

Discussion and Directions for Future Research

The purpose of this study was to provide a conceptualization of binge watching and develop two measures of binge watching that would provide this line of research a way to consistently measure this behavior across studies and samples. Much of the research in binge watching thus far has operationalized the construct in a variety of ways, and this lack of uniformity presents a challenge when building theory or comparing results across studies. Our scales are specifically intended to operationalize the behavior of binge watching itself, and not its potential correlates such as media enjoyment, addiction, or involvement.

The GBWS, a two-factor, seven-item scale, provides a means with which to measure an individual's tendency to binge watch overall. The scale was demonstrated to be reliable. Scale validity was demonstrated by positive correlations with measures of overall television viewing, television addiction, and attitudes toward binge watching. This scale was developed by considering the central components of binge watching currently represented in the literature. The GBWS captures consumption of multiple episodes of the same program, and on a more frequent schedule than serial watching of programs. The GBWS also adds a subscale that measures the "binge" aspect of binge watching reflecting a tendency for binge watching to happen compulsively and not always with intention (Riddle et al., 2018). This is an aspect of binge watching that has been absent from many of the current measures but can prove useful in considering the role that impulsivity plays in the antecedents and effects of binge watching. When the factors are considered separately, the fundamental factor provides a means with which to measure binge watching without the unintentional consumption of more television than intended. The impulsive factor when considered separately allows for the measurement of compulsive consumption of episodes, which may be relevant for studies comparing binge watching to other binging behaviors such as binge drinking or binge eating. The GBWS should be interpreted in such a way that it represents the intensity of binge-watching behavior.

Additionally, an adapted version of the GBWS was developed as a means to measure the degree to which specific individual programs are binge watched. The SPBWS scale was adapted successfully, with the elimination of one item that did not translate over to a single program format. Similar to the GBWS, the SPBWS will enable researchers to measure fundamental binge watching of a single program, as well as capturing the impulsive aspect

of binge watching. This scale will be useful for researchers interested in how binge-watching specific programs may relate to constructs such as identification with characters, parasocial relationships or involvement, for example.

The SPBWS was also demonstrated to be reliable, as well as significantly correlated with binge-watching attitudes, and predictive of self-reported frequency of binge watching. The measure of single-program binging was found to positively correlate with overall television viewing on the fundamental factor, but not with the whole composite measure or the impulsive factor. We believe this could be because, in part, participants were asked to select only one program for the SPBWS. It's possible that their viewing behavior related to that particular program may differ from their overall television-viewing behavior.

It is the hope that the development of the GBWS and the SPBWS will offer binge-watching researchers scales with which to consistently and reliably measure the behavior. Binge watching is prevalent and more and more media companies are releasing streaming services, such as Disney+. As binge-watching continues, the need to further understand the behavior as well as its implications will become even more necessary. The discipline has a solid grasp on the effects of television viewing, and empirical measurement tools such as these scales will enable binge-watching scholarship to understand how these effects are similar or different with this new method of television consumption.

As with all research, there are several limitations that should be noted. The GBWS was tested with undergraduate students and thus the results may not be generalizable across populations. Additionally, the development of the single-program scale used a demographically different sample. While this may increase generalizability for this scale specifically, it cannot be determined if each scale would be successful with each of the different samples. More research with each scale on different demographics is needed. Further, the small compensation for sample three could have affected the quality of data. Additionally, discriminant validity was not established with these scales and thus provides a limitation to the potential validity of the scales. Future research should attempt to capture serial watching in an effective manner to establish discriminant validity with these scales. Finally, we note that more confirmatory factor analytic approaches are needed on additional samples to further confirm the model fit of these scales. Testing each measure on different sample populations and continuing to validate these measures is important in order to confirm their reliability and ability to accurately capture the binge-watching phenomenon.

Conclusion

As the popularity of streaming services to consume television continues to grow, binge watching has become more prevalent. Binge-watching research is still exploratory and the measurement tools used thus far have been varied and inconsistent. This study sought to develop and provide initial testing for two empirical measures of binge watching, the GBWS for measuring overall general binge-watching behavior, as well as the SPBWS for measuring binge watching of a single-specific program. The GBWS is a two-factor scale that measures both fundamental binge watching and impulsive binge watching. The scale was demonstrated to be reliable and valid across each factor, as well as when considered as a unidimensional measure. The SPBWS used an adapted wording of the first scale, and was again demonstrated to be reliable and valid across both fundamental single-program binge watching and impulsive binge watching. The GBWS can be implemented in research that is examining individuals who would be considered

regular binge watchers. This may be relevant to studies concerning the behavior of binge watching overall and how it may relate to levels of depression or loneliness, for example. In contrast, the SPBWS serves to measure individual program binge watching and can be used to further examine the relationships that might be associated with this method of viewing particular programs (e.g., parasocial relationships or involvement). Hopefully these scales will allow binge-watching scholarship to advance, allowing for consistent measurement across quantitative studies in the hopes that consistent results can drive the formation of a theoretical framework relative to this popular phenomenon.

Note

1. Supplementary items including scale items are available at https://osf.io/f6hr8

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Declaration Of Interest Statement

We wish to confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.

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