

Article

A Television Pop Icon's Frustrating Bubble Bath: Wardrobe Malfunction or Video Compression Artifact?

Ronald B. Brown 

Waterloo Institute for Complexity and Innovation, University of Waterloo, Waterloo, ON N2L 3G1, Canada;
r26brown@uwaterloo.ca

Abstract

This qualitative media-archaeology study examines how digital video compression can reshape viewer perception of a legacy television image. A low-resolution online image from the 1976 *The Mary Tyler Moore Show* is compared with the corresponding image from a commercial DVD. In the compressed 360p online version, Moore's upper torso appears briefly overexposed during a bubble-bath scene—an interpretation often described as a wardrobe malfunction. However, the higher-resolution DVD clearly shows that Moore maintained broadcast standards by wearing a protective undergarment that became visually erased in the compressed media. This divergence serves as a result of a natural experiment, demonstrating how low-resolution encoding of an image produces edge smoothing, tonal blending, and dissolution of material boundaries. These transformations support an inductive interpretation of materiality collapse, a compression artifact in which garments, skin, and shadows lose visual distinctiveness—creating an image of Mary Tyler Moore perceptually similar to a classical nude sculpture such as the *Venus de Milo*. Contextual evidence from Moore's autobiography further clarifies production norms that shaped the bubble-bath scene and contributed to insufficient foam coverage. The findings show how compressed digital video can generate culturally consequential misperceptions, underscoring the need to scrutinize online compressed images posted as material evidence.

Keywords: Mary Tyler Moore; media archaeology; television studies; stage effects; visual perception; wardrobe malfunction; visual pop culture; video compression artifact; materiality collapse

1. Introduction

This qualitative paper investigates a media archaeology discovery involving an apparent transgression in a television broadcast featuring one of the most respected figures in American popular culture. The incongruity between revered 1960s–1970s television pop icon Mary Tyler Moore (MTM) and the uncensored appearance of what seems to be her topless bare skin in online digital video frames seems absurd and demands explanation. Widely recognized symbols and figures of popular culture like Mary Tyler Moore become meaningful through the visible physical forms in which they circulate, are perceived, and are interpreted by the masses (Storey, 2024). This paper examines the sequence of events that produced an unusual media discovery in legacy television and visual pop culture.

In today's media environment, saturated with fabricated and manipulated video, a compromising image of Mary Tyler Moore might be easily dismissed as just another fake. Yet the image in question emerged autonomously in an online video, seemingly persisted unnoticed for decades, and appeared to depict a momentary lapse in broadcast



Academic Editors: Marica Spalletta,
Federico Tarquini and Tito Vagni

Received: 18 March 2026

Revised: 5 July 2026

Accepted: 8 July 2026

Published: 12 July 2026

Copyright: © 2026 by the author.

Licensee MDPI, Basel, Switzerland.

This article is an open access article distributed under the terms and conditions of the [Creative Commons Attribution \(CC BY\)](https://creativecommons.org/licenses/by/4.0/) license.

production standards. This paper explains how that topless image came into existence, why it remained undetected for so long, and how comparison with a higher-definition version ultimately debunked the illusion—vindicating the professionalism and sterling reputation of the television pop icon.

Media archaeology techniques used in this paper unravel both the technological and historical conditions that produced the media artifact in its current form. Leading media archaeologist Jussi Parikka defined media archaeology as a form of excavation, an approach that treats media artifacts as stratified constructions whose visible surface is shaped by deeper layers of technological operations, storage formats, and transmission histories that must be uncovered to understand how an image was formed (Huhtamo & Parikka, 2011; Parikka, 2012). As television has shifted from fleeting electronic broadcasts to durable digital media artifacts that can be physically examined, media archaeology offers a way to make sense of the changes that occurred along the way. Early television existed only as a live signal that disappeared after airing, but home videotape, professional archiving, and later digitization gradually turned it into something that could be stored, copied, and circulated (*Television as digital media*, 2011). In the streaming era, television now survives mainly as a stable digital artifact, shaped by software encoding and platform algorithms rather than by the conditions of broadcast. Accordingly, media archaeology investigates and interprets the deeper layers that shaped Mary Tyler Moore's excavated image, including the 1970s analog broadcast environment within which Moore thrived, the later digitization of archival footage, and the low-resolution (360p) online copies through which contemporary viewers may encounter the scene.

The source of the discovered artifact in question is embedded within a bubble-bath scene from a 1976 episode of *The Mary Tyler Moore Show*. The artifact's discovery emerges exactly fifty years after the episode first aired, a temporal distance that suggests a past event in television history, although the digital format of the image also suggests a media artifact originating in the present digital age. In the reviewed frames of the video, the eponymous show's leading actress performs a bathtub farce—a comedy trope used as “visual shorthand,” which allowed television shows at the time to represent adult subjects such as nudity indirectly through strategic scenic arrangements while navigating broadcast standards (Spigel, 1992).

The frustration of the MTM bubble-bath scene operates on three levels: narratively, as written in the television script; production-wise, due to a faulty stage effect; and more recent frustration associated with the discovery of a compromising online video image of the television pop icon. In the script of the scene, Moore's character, Mary Richards, is frustrated by the intrusion of three male co-workers into her bathroom who are oblivious to her mounting embarrassment and mortification. Equally frustrating is that the quantity of bath foam in the production appears insufficient to provide the necessary safeguards to ensure compliance with ethical broadcast codes. Indeed, Mary Tyler Moore is seen throughout the sequence constantly gathering the scanty bits of foam around her for coverage. Even more frustrating is that with no undergarment visibly in place to provide backup protection, Ms. Moore appears topless in online video frames for a very brief instant as she sits upright above the waterline in her bathtub before quickly ducking back down under the sudsy bath water. This “blink-and-you-miss-it” moment appears to be a combination of a miscalculated stage effect and a wardrobe malfunction.

Fortunately, this embarrassing incident was likely lost in the low-resolution 1976 analog broadcast conditions and was invisible to television viewers who encountered it only once, in real time, without the benefit of playback. Its discovery today is made possible by digital media sources and applications to locate, screen-capture, and scrutinize individual digitized frames that reveal this controversial artifact of visual pop culture.

However, why did this incident occur, and how was an unintentional distortion generated by software? This paper aims to answer those questions.

The significance of the compression-induced transformations examined in this paper lies in how they function as subtle, technically generated forms of visual misrepresentation—an effect that this study subsequently defines in more technical terms as materiality collapse. Because compression-induced blending, smoothing, and boundary dissolution appear so natural to the viewer, the resulting distortions function as a stealth form of deception—unintentional, yet fully capable of reshaping what viewers believe they are seeing. Importantly, unlike overt manipulation or digital fakery, which may quickly raise suspicion, materiality collapse is difficult to detect precisely because it arises from ordinary encoding processes that sometimes leave little visible trace of alteration. This makes the phenomenon highly consequential: compressed digital artifacts may be easily misinterpreted and quickly accepted as reliable material evidence even when their underlying materiality has partially collapsed.

Indeed, the apparent stealth deception associated with materiality collapse in the Mary Tyler Moore compressed video image is perceptual rather than intentional, becoming visible only because of its striking incongruity with the public's enduring understanding of Moore's life, work, and professional standards—a point documented in the narrative of this paper. While it is important to acknowledge Moore's cultural position and her role as a model of female agency and sexuality within the broadcast norms of her era, a fuller exploration of these cultural dimensions lies outside the methodological scope of the present media-archaeological study. The focus here remains on excavating the technical and historical layers that produced the digital artifact—specifically the historical 1970s television production practices, broadcast standards, and technological conditions that shaped how the MTM scene was originally staged and recorded. The paper further describes how Moore navigated 1970s broadcast codes and demonstrates how materiality collapse can lead to subtle but consequential misinterpretations when compressed images circulate as material evidence. In an era when digital images circulate widely and increasingly inform public judgments and institutional decisions, understanding media vulnerability to the subtleties of materiality collapse is essential.

2. Materials and Methods

The present media archaeology study used qualitative comparative analysis to examine how the same televised moment changed when it appeared in a different visual format. Qualitative comparative analysis is widely used in media and visual studies to identify patterned differences in what images signify when they are reproduced and circulated within different formats (Bolter & Grusin, 2000). As is often the case with qualitative interpretation of visual material, the present analysis involves the author's subjective perceptual judgment. The conceptual model presented in this paper reflects the patterned transformations observed in the comparative materials while recognizing that viewers may differ in how they perceive these video distortions.

To increase the paper's objectivity and rigor, a grounded theory method is used in the discussion and interpretation of the comparative analysis. Grounded theory provides an inductive approach to synthesizing an explanatory theory of a subject based on concepts grounded in evidence (Glaser, 2002). This method's conceptual approach is also well established in media research, where scholars routinely allow interpretive categories to naturally emerge from the material and narrative features of media artifacts rather than impose predetermined theoretical frameworks to interpret artifacts (Hine, 2000; Jensen, 2002). This inductive method facilitates a materially grounded assessment of media, ensuring

that theoretical conclusions are rooted in the specific technical and cultural properties of the artifact.

To ensure research reliability and validity, a stable and verifiable source of the media artifact is required (Caswell, 2023). Online postings of the episode may be unreliable: they can be removed, replaced, or altered, and their sources are often uncertain. Accordingly, the author purchased a physical DVD copy of the seventh season of *The Mary Tyler Moore Show*, thereby providing a fixed, reproducible version of the episode that future scholars can obtain and examine. The DVD is not presented in high definition (HD), and no publicly available HD edition of the episode currently exists, suggesting that the current DVD reflects the highest-fidelity version presently accessible to the public.

The study analysis compares digital video frames from two versions of a brief sequence from the bubble-bath scene in *The Mary Tyler Moore Show*, Season 7, Episode 11: *Mary's Insomnia*. The first version of the sequence from an online low-resolution video begins at the approximate timeframe 15:50, <https://youtu.be/Lw-W4WEMrRY?t=950> (Classic Films & Serials Now!, 1976; accessed on 1 March 2026), and the second version of the corresponding sequence is from the higher-resolution DVD (Twentieth Century Fox Home Entertainment, 2010). A reference image of the *Venus de Milo* was also used in the comparative analysis (Grandmont, 2011). By rigorously observing differences in material patterns, this approach provides a natural experiment, enabling the identification of systematic transformations that arise when images migrate across media environments.

3. Results

The analysis compared three visual sources: an image from the online version of the bathtub scene from *The Mary Tyler Moore Show*, *Mary's Insomnia* (A), the corresponding image from the show's commercial DVD (B), and a reference image of the *Venus de Milo* (C). Because the scene involves partial nudity, the images themselves are not reproduced in this paper to preserve modesty. The purpose of this section is strictly observational. It documents visible tonal patterns, boundary and shape distinctions, and other garment details—without drawing any inferences about the causes of those differences. These observations provide the empirical foundation for the paper's subsequent discussion, interpretation, and conceptual model.

3.1. Observations from the Online Image (A) and the *Venus de Milo* (C)

The online image A contains a brief moment in which Mary Tyler Moore is visible above the waterline. This frame produced a clear initial impression followed by a revised interpretation upon closer inspection.

1. Shadowing beneath Moore's breasts in image A appears similar in curvature, placement, and overall visual effect to the sculpted shadowing in the *Venus de Milo*, reference image C. Based on this appearance, there is little doubt that Moore appears to be topless in image A, similar to a classic nude sculpture.
2. A more detailed viewing of image A suggests that the shadow region beneath Moore's breasts appears as a light beige area that could plausibly represent a transparent slip rather than a natural anatomical shadow.
3. Moore's torso in image A appears as a continuous surface with no visible boundary indicating opaque clothing.
4. Two round light-brown regions are visible in image A, interpreted as areolae of the breasts, although nipples are not distinct.

3.2. Observations from the Online Image (A) and DVD Image (B)

The DVD image B provides a clearer view of the same scene and reveals garment details not visible in the online version. The following observations describe the visible differences between images A and B.

1. In the DVD image B, Mary Tyler Moore is clearly wearing a dark beige undergarment with an irregular rectangular dark brown patch over each breast that appears to be adhesive tape.
2. The placement of the dark brown patches on the breasts in B corresponds with the appearance of round and light brown areolae in A.
3. The garment in B maintains distinct boundaries separating fabric from skin.
4. The dark beige garment in B resembles the shape of the light beige shadow beneath the breasts observed in A.

4. Discussion

The following discussion includes an interpretation and conceptual model of the results, grounded in a review of contextual evidence. Several research questions are discussed: Why did Mary Tyler Moore's apparent wardrobe malfunction occur in the bubble-bath scene, and why did she appear to be topless in the online version of the scene when a protective undergarment is clearly visible in the DVD version? Furthermore, because media archaeology attempts to connect media artifacts with the cultures that produced them, the narrative includes an investigation of MTM's television career to identify information that is contextually relevant to the discovered digital artifact.

The reader may question the relevance of a single isolated case as representative of a significant issue, especially if it has received little recognition by the general public. Media archaeology, however, does not evaluate significance by viewership metrics or by the visibility of an artifact in public discourse. Its purpose is to excavate media formations that lie beneath ordinary perception—precisely the kinds of artifacts that remain unnoticed, unremarked upon, or buried within technical processes. The fact that no viewers commented on the apparent nudity and that the artifact was discovered decades after the media source was produced is consistent with this methodological premise: compression-induced distortions appear natural and, therefore, easily escape detection.

The value of the present case lies not in its popularity but in its function as a natural experiment that reveals how low-resolution encoding can dissolve material boundaries and generate misinterpretations. The compressed image reflects the intersection of two cultural layers: the production norms of 1970s sitcom television and the technical conditions of contemporary online video. Analyzing this artifact, therefore, provides insight into both the historical media environment that created the original scene and the digital encoding processes through which its appearance changed. Finally, because materiality collapse occurs largely beneath ordinary perception, its significance often becomes apparent only after an artifact is excavated, analyzed, and made visible through scholarly investigation. The discovery of this MTM artifact therefore illustrates how a media-archaeological inquiry can surface previously unnoticed distortions and, in doing so, may contribute to the refinement of future digital-media analysis techniques.

4.1. Mary Tyler Moore's Television Career

Mary Tyler Moore's 1976 appearance in a bathtub scene in Mary's *Insomnia* coincides with her earlier work as Laura Petrie on *The Dick Van Dyke Show*. In the prior show's 1965 episode *Never Bathe on Saturday*, written by Carl Reiner ([The Dick Van Dyke Show, 1965](#)), Laura's toe becomes stuck in a bathtub faucet—a scene in which the embodiment of MTM's character is reduced to an invisible off-camera voice locked behind a bathroom

door. Writing in her autobiography (Moore, 1995), Moore singles out the emotional trauma she experienced during the episode's production, recounting how "I was eagerly awaiting the script that Carl had been alluding to without detail for weeks." Upon finally receiving the script, Moore was deeply disappointed to find that her role was reduced to nothing more than a disembodied voice, recalling that "my great expectations were dashed." She uncharacteristically walked off the set.

Moore continued to write that after consuming an alcoholic drink in her dressing room that morning, "I placed my tail firmly between my legs and slinked to the set. For the rest of the day, I gave a good impression of an unwilling actress going through the 'moves'." While bravely acknowledging that the bathtub episode received good notices from the public and industry people, the hurt in her voice is apparent. Despite claiming to have been "in the throes of nicotine withdrawal" on the morning of her walk-off, the salient point remains that from the moment she received the script, Mary Tyler Moore likely understood—and resented—that she had been physically banned from the scene.

To understand why this pop icon's physical presence was perceived as a threat in her earlier appearance on *Never Bathe on Saturday*, one needs only to view Mary Tyler Moore elegantly posed in her bubble bath at the beginning of the 1976 scene from *Mary's Insomnia*. Her appearance conveys a level of suggestive sex appeal that producers of the earlier era likely considered too risqué for family-hour sitcoms. The decision to ban Laura Petrie from appearing on camera appears to have been based on the perceived risk of filming a glamorous 29-year-old actress in a bathtub during a period of strict broadcast decorum.

In her later 1976 bubble-bath scene, any legacy of the emotional trauma that MTM previously endured is defiantly confronted in her postural attitude as the scene opens. She reclines comfortably in the tub, one foot casually raised out of the water and resting against the tub's rim with her toes prominently pointing upward. Perhaps merely by coincidence, Moore appears to be recreating the precise physical configuration that her character Laura Petrie would have assumed in 1965 when her upright toe became stuck in the faucet. The significance of this scene reveals how Mary Tyler Moore eventually rose above censorship obstacles and triumphantly reclaimed her on-screen physical presence years later. Just as Carl Reiner had used visual shorthand to imply nudity by showing a locked bathroom door with her voice behind it, Mary Tyler Moore metaphorically unlocked the door on her own show and invited viewers to come inside and watch her taking a bubble bath.

The absence of any reference to the 1976 bubble-bath scene in Mary Tyler Moore's 1995 autobiography is noteworthy, suggesting that she perceived nothing unusual or improper about the moment. The actress's unawareness is supported by the scene's video frames. During the brief lapse in foam coverage, Moore's gaze remains fixed on her co-star's eyes, allowing the accidental exposure to escape visual confirmation by either actor. Plausibly, the live audience may have also been aware that Moore was wearing a protective undergarment, having seen her enter the set and position herself within the foam. If so, this would explain why the brief exposure of the garment during the live performance did not interrupt audience laughter, which may reflect an implicit acceptance of the garment's presence as a necessary precaution.

Moore's own description of the show's production environment supports this interpretation. In her autobiography, she characterizes the set as casual and open, with audience members free to come and go between takes as scenery was moved and actors changed wardrobe. This context suggests that the visual exposure was not perceived as a serious transgression at the time of filming. The presence of a protective undergarment likely satisfied network television broadcast censorship standards, allowing the scene to pass through review without objection. The brief lapse in foam coverage, while visible on set,

would have appeared less distinct to television audiences due to the low resolution of analog broadcast formats, thus shielding the garment's exposure from the general public.

The subsequent release of the scene on commercial DVD, followed by its reproduction in compressed online media, created a modern natural experiment for visual interpretation. The DVD version, encoded at higher resolution, reveals the undergarment clearly in a way that was not likely perceived during the original television broadcast. By contrast, the garment's visual boundaries become dissolved in the online 360p digital version, revealing the appearance of exposure. This divergence illustrates how media migration across platforms can generate culturally consequential misreadings through material transformations. But how?

Moore's autobiography further provides evidence that any exposure in the bubble-bath scene was unintentional and that Mary Tyler Moore consistently prioritized protecting her "modesty." She recounts sunbathing in front of her Malibu beach house, lying face-down on a towel with her top undone, when she suddenly heard the voice of superstar Cary Grant above her, appearing to say, "I admire your work." Startled, she immediately fumbled to reattach her top "to preserve my modesty," only to hear Grant apologize for disturbing her as he backed away before she could say thank you. "To this day," she wrote, "I agonize over the lost opportunity to have had a conversation with the man I had most admired for his comedic ability and on whom I had had a major crush." Moore paid a steep emotional price for prioritizing her modesty.

MTM's commitment to modesty remained unshakeable despite her physical attractiveness. She writes in her autobiography that "I never calculated how to be sexy." She doesn't need to—Moore described how every husband across America seemed to be in love with Laura Petrie's natural feminine charm, yet wives felt unthreatened because of Laura's devotion to her on-screen marriage, which exemplified strong monogamous values. Even Elvis Presley confessed his earlier crush on Mary Tyler Moore when she appeared as his leading lady in the 1969 movie *Change of Habit*. When Presley remarked that he had slept with all his leading ladies but one, Moore boasted in her autobiography that she knew exactly who the "one" was. Although Mary Richards' values may have differed from Laura Petrie's, Mary Tyler Moore's commitment to her modesty never changed. After Carl Reiner's young son Rob "reached out and swatted my behind," Moore wrote how she took ladylike action and promptly reported his inappropriate behavior to the elder Reiner for disciplinary action. When meeting Pope John Paul II with her parents, Moore described the Pope as "someone whose power is beyond comprehension" and worried if her wardrobe would be "Pope-appropriate." Taken together, these examples of modesty underscore the incongruity of an ethical-standards transgression supposedly occurring in her 1976 bubble-bath scene. The veracity of the digital clip's low-resolution evidence remains questionable, while Mary Tyler Moore's ethical standards remain rock solid and beyond reproach.

4.2. Stage-Effect Bubble Baths—Then and Now

Evidence in the MTM bubble-bath scene strongly suggests that the full bubble bath was not run during a dress rehearsal, which might have helped prevent a lapse in foam coverage. Rehearsals in television sitcoms are quite different from theatrical productions (Miller, 2025). In theatrical practice, dress rehearsals traditionally include all technical effects—full props, costumes, lighting, sound, and any complex stage effects—specifically to test production features and prevent problems during performances. Although live theatre culture treats the dress rehearsal as a complete simulation of the final show, on-camera production operates differently. Film and television rehearsals typically focus on actor placement (blocking), camera positions, and line delivery, not full technical execution.

Actors often rehearse without final props, without full costumes, and without stage effects that would be standard in theatre. Messy, time-consuming, or cleanup-heavy effects—such as running water, food, breakable objects, or anything requiring plumbing or rapid reset—are frequently omitted until the actual shoot.

A striking historical precedent reinforces the on-camera practice of skipping full dress rehearsals. In her autobiography, Mary Tyler Moore describes an elaborate physical effect during a dream sequence on *The Dick Van Dyke Show* in the 1963 episode *It May Look Like a Walnut*. Laura Petrie's husband Rob is flooded with one thousand pounds of walnuts released from a closet, with Laura, cast as Lolak from the planet Twilo, riding atop the crest of tumbling nuts. Moore writes, "Because of the time and manpower required to collect the nuts after their release, a full-scale rehearsal was out of the question. A lot of guessing and praying had to suffice." This firsthand account demonstrates that the production teams behind both *The Dick Van Dyke Show* and *The Mary Tyler Moore Show* were willing to stage complex and risky effects, such as a bubble-bath scene without a full rehearsal, when time and cost constraints made rehearsal impractical.

Production procedures for filming a bubble-bath scene today are also more technically advanced than those in the 1970s. A side-by-side comparison of Mary Tyler Moore's 1976 bubble-bath scene with Margot Robbie's 2015 bubble-bath scene from the movie *The Big Short* is enlightening (<https://youtu.be/1Rhs3PVAP4o?t=20>, accessed on 15 March 2026). In her scene, Robbie sits confidently upright in a bathtub and enjoys sipping a glass of wine as she delivers a monologue while surrounded by a high-volume, dense layer of luxurious suds that provide secure coverage. By contrast, Moore is forced to nervously cower under a sparser, soapier water level in her televised bath, making modesty coverage much more challenging, especially in front of a live-studio audience.

The discrepancy between these two scenes is rooted in the chemical development of staged bubble-bath effects. While the translucent bubbles in Moore's era likely used aqueous chemical agents that dissipate rapidly, modern cinematic foam appears to have improved these limitations. In more contemporary productions, stiff-foam stage effects can be achieved by incorporating viscosity-enhancing polymers such as methylcellulose or hydroxypropyl methylcellulose (HPMC) with a plasticizer like glycerol—combinations extensively studied for their film-stabilizing properties (Athanasopoulou et al., 2025; Jouki et al., 2013). Methylcellulose, when added to liquid bubble bath concentrates, produces a thick, viscous consistency (Nasatto et al., 2015)—a property that makes it suitable for stable foam generation in stage effects. On the other hand, the visual vulnerability in *Mary's Insomnia* scene is linked to evaporation, where liquid drains from a bubble's film and leads to rapid thinning with eventual transparency (Gennes et al., 2004). In the absence of modern stabilizing agents, Moore's 1976 bath foam likely produced a more translucent and weaker volume of suds that offered minimal concealment as she momentarily sat upright above the water level.

4.3. MTM Productions

Mary Tyler Moore's descriptions in her autobiography precisely reflect her connection to the production culture in which she worked. Her academic approach to writing and attention to detail give Moore's testimony particular reliability as she constructs an evidence-based document rather than a casual celebrity memoir.

Moore provided several clues about the broader organizational environment at MTM Productions. She noted that her independent production company was supported by a new president at Columbia Broadcasting System (CBS) who was determined to "take some risks" on intelligent programming. This mandate fostered a creative culture that attracted talented writers "in a business where 'Hurry!', 'make it cheaper,' and 'because

I said so' were the bywords." Although the MTM company valued quality, it operated within an industry whose norms were speed, cost-cutting, and top-down decision-making. The tension between artistic ambition and production pressures helps explain why the company often embraced improvisation and high-risk staging choices.

Moore's recollection of the equipment used during the show's early days further illustrates the production culture's pragmatic, risk-tolerant character. She describes the obsolete cameras used to shoot the dress rehearsal and first episode of *The Mary Tyler Moore Show* as "behemoths designed to cut cost," calling them "dinosaurs that all but obliterated the view for the people in their bleacher seats." These autobiographical notes reveal a consistent pattern: MTM Productions operated within a high-pressure, cost-conscious industry while simultaneously striving for creative excellence. The result was an organizational culture that tolerated risk and imperfect rehearsal conditions and relied on performers' adaptability. The tumbling walnuts and the bubble-bath lapse are expressions of a production culture that balanced creative ambition with expediency, trusting that talented actors and writers could navigate the challenges when complex effects were staged without full technical rehearsal.

4.4. Wardrobe-Lapse Hypothesis

Based on the evidence reviewed in this paper, the most plausible hypothesis explaining why the wardrobe lapse occurred in the 1976 *Mary's Insomnia* bubble-bath scene is that the foam quantity was likely not sufficiently tested and adjusted in advance by production staff at MTM Productions. The bubble-bath foam visible in the broadcast forms only a thin, superficial layer floating on the water's surface. It was sufficient to cover Mary Tyler Moore's body below the waterline, but it never had the depth or volume required to provide sufficient coverage above the waterline. Indeed, at the beginning of the scene, Mary Richards' lower extremities are partly exposed immediately above the waterline. As long as Moore kept her upper body submerged, the foam preserved her modesty. Had the production run the full bubble-bath scene during dress rehearsal, the insufficient foam depth above the waterline would have been immediately apparent as she shifted her upper body in the tub to an upright position. Although the actress seemed aware of the limited movement she was allowed in the bathtub, it does not appear she had an opportunity to test run the scene.

Moore's behavior in the scene is consistent with a performer coping with a risky situation in real time. Throughout the scene, she keeps her upper body underwater and repeatedly gathers foam around herself, suggesting an intuitive awareness that her coverage is marginal. At the key point in the dialog, where her boss Lou Grant asks if she thinks he came over to cop a peek at her, she briefly sits up above the waterline and vigorously protests "Of course not!". Because no foam existed at that height, the protective undergarment became visible. Although she does not look down, she would almost certainly have felt the sudden shift from warm water to cool air on her exposed skin, prompting her immediate return to a submerged position. This response is consistent with her lifelong modesty, as described in her autobiography.

The performance itself contains further evidence of inadequate rehearsal. Several line flubs and timing irregularities occur during the dialog, including Lou Grant's awkward phrasing that he had been "home relaxing with my shoes on." Mary's near-slip occurs when she begins to say that Lou is "here in my bath. . .," before hesitating and completing the line to "room," perhaps preventing a flub in which she seemed about to say that Lou Grant was "here in my bathtub." These errors may be characteristic of performers whose stress has suddenly increased—in this case because the full performance of the bubble-bath setup was being experienced for the first time in front of a live audience. Delivering lines while

submerged in water, maintaining modesty, monitoring foam coverage, and responding to another actor's cues contribute to a much more stressful performance than rehearsing from a script at a table. The resulting dialog hesitations, overlaps, and self-corrections are consistent with a scene being partially improvised during live taping rather than a fully rehearsed performance.

This hypothesis is grounded in converging lines of evidence, including the actors' tenuous behavior in the scene, the compromised physical properties of the bubble-bath foam, and Moore's account of reduced rehearsals for special effects, consistent with on-camera practices. Like any archaeological interpretation, this hypothesis does not claim causative proof; rather, it offers the most coherent explanation for the physical and behavioral evidence associated with the discovered artifact.

4.5. Video Compression Artifacts and Materiality Collapse

Having explained the association of the discovered media artifact with 1960–70s television pop culture, what remains to be clarified is the technical transformation of the MTM image into a low-resolution digital version posted online. Visual compression artifacts are unintended visual distortions that occur when digital media is compressed using lossy algorithms that permanently discard data deemed unessential to human perception. Unterweger noted in 2013 that while video compression efficiency had technically improved, avoidance and compensation of coding artifacts were not receiving the attention they deserved (Unterweger, 2013). Although lossy algorithms reduce file size for easier digital storage and transmission, missing data from over-aggressive compression results in noticeable flaws that differ from the original content. According to Unterweger, "In the end, it is the casual user, unaware of the mere existence of the most sophisticated coding tools, who judges the visual quality and the visibility of coding artifacts." The casual user's judgement and perception of a coded video-compression image address an important research question in the current paper: what does the user perceive, and how does a compressed image become distorted?

While the DVD of *The Mary Tyler Moore Show* typically utilizes the MPEG-2 standard—a format that maintains higher bitrates and preserves more subtle textures—online distribution almost exclusively employs H.264/MPEG-4 Advanced Video Coding (AVC) (Wiegand et al., 2003). This modern codec is designed to achieve significant bitrate reductions (approximately 50% compared to MPEG-2). In low-bitrate streaming, H.264 utilizes aggressive quantization that often fails to preserve low-contrast, fine-grained textures (Zeng et al., 2014).

One of the most consequential distortions introduced by low-resolution compressed digital media is a loss of materiality—the collapse of the physical form that once distinguished bodies from the objects that surround them. Media archaeology scholars such as Ernst (Ernst, 2013) have shown how digital systems diminish or erase the material properties of analog media. This phenomenon is not merely a matter of poor quality but involves a structural transformation in which compression algorithms erase the optical and material cues that allow viewers to accurately perceive image details. This collapse is a type of video compression artifact documented in the literature, along with macroblocking (chunky blocks of pixels), chroma subsampling (color bleeding), gradient quantization (smooth lines transformed into staircase bands), and motion prediction errors (blurring) (Richardson, 2011).

While materiality loss describes the disappearance of physical features in digital media, the present case reveals a more specific, compression mechanism and effect. The author therefore introduces the term materiality collapse to describe this specific image transformation. Materiality collapse in digital compression is formally defined as the collapse of distinct visual features within an image into a single reduced transformation.

The encoder does not merely degrade the image; it reorders object relationships and merges disparate textures into a uniform digital texture.

A simple example of materiality collapse illustrates the mechanism. Consider a woman wearing a low-cut top whose fabric is close in brightness (luma) and color (chroma) to her skin. The garment is clearly visible on the original high-resolution image; the fabric has texture, and the boundary between cloth and body is unambiguous. But in a low-resolution compressed version of the image, the top can effectively disappear. The garment collapses to a dark patch that appears not as fabric but as a shadow on bare skin. The viewer perceives the woman as topless, even though the original image shows nothing of the sort. This distorted perception is a predictable outcome of compression systems that simplify images into averaged color regions (Richardson, 2011).

While Mary Tyler Moore's physical undergarment in the bubble-bath scene remains visible on high-bitrate media like the DVD release, it effectively vanishes in lower-bitrate compressed versions due to materiality collapse. Because compression algorithms maintain high-contrast features and often discard low-contrast, fine-grained textures, the encoder misinterprets the garment as redundant data. This subsequent digital erasure creates a compression artifact that falsely suggests a wardrobe malfunction where none existed.

The transformation in materiality collapse occurs through several technical processes, illustrated in the conceptual model in Figure 1.

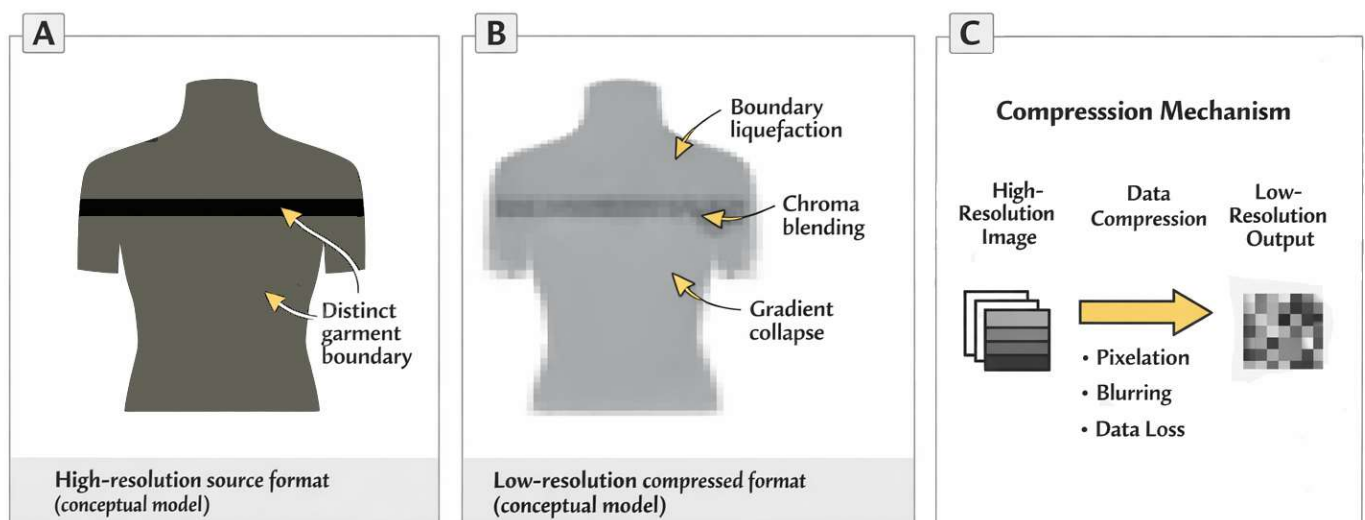


Figure 1. Materiality Collapse. The conceptual model explains how a high-resolution source format (A) is transformed through lossy compression into a low-resolution format (B) through boundary liquefaction (loss of edge definition), chroma blending (merging of color information across adjacent regions), and gradient collapse (flattening of tonal transitions) (National Research Council, 2015; Winkler, 2005). The compression mechanism leading to pixelation, blurring, and data loss is also shown (C).

First, compression eliminates fine details that signal material differences, such as edge definitions (Winkler, 2005). When the garment and the skin share similar brightness and color, the encoder treats the boundary between them as redundant and averages the pixels into a single block. The result is a materiality collapse as textile and tissue become visually indistinguishable. This is the same mechanism that underlies chroma bleed in heavily compressed streaming video, where the encoder merges adjacent regions of similar color into a single simplified patch (Poynton, 2012).

Second, low-resolution encoding cannot preserve subtle gradients. The soft shadow created where fabric meets skin becomes a single, crushed dark block. In the absence

of texture or edge information, the viewer's perceptual system interprets this block as a shadow cast by the body rather than as the presence of clothing. The artifact thus reconstructs the scene according to its algorithm, not the original physical environment. This gradient-crushing effect is a hallmark of low-bitrate encoding (Winkler, 2005). Media archaeologists refer to this as liquefaction—a state in which the human form and the objects upon it melt into a single, continuous surface (Huhtamo & Parikka, 2011; Parikka, 2012). Clothing loses its structure; hems, seams, and folds vanish; and the image bleeds into a simplified, skin-colored field. Under these conditions, the digital artifact can hallucinate a perception of nudity even when none existed.

Additionally, the interpretation of the compressed image is shaped not only by the material transformations of low-resolution encoding but also by the cultural visual heuristics or mental shortcuts that viewers rely on to interpret ambiguous forms. Research on visual culture shows that images are not passively received but interpreted through shared aesthetic ideals and culturally embedded schemas—mental frameworks that organize and interpret information. As MacCallum and Widdows note, even when images do not appear to make sense, “images are interpreted, critiqued, rejected and renegotiated as individuals and groups,” and contemporary beauty ideals are “increasingly globalised and homogenised,” shaping how viewers share cultural evaluations of bodies and surfaces (MacCallum & Widdows, 2018). When compression smooths edges, erases garment boundaries, and reduces surface detail, the resulting figure aligns with familiar Western aesthetic conventions of the classical nude, such as the simplified contours and continuous tonal surfaces of the Venus de Milo. This cultural familiarity provides a perceptual heuristic through which ambiguous or degraded images are resolved, helping explain why the compressed frame is readily perceived as nudity even if the high-resolution source reveals clothing. The cultural consequences are significant. A viewer encountering a low-resolution clip from a 1970s television show may believe a performer is dressed provocatively—or even indecently—when the original broadcast presented a modest, fully clothed figure.

4.6. Materiality Collapse of the MTM Bubble-Bath Image

Interpretation of the results from the comparative analysis of the MTM bubble-bath video frames suggests that materiality collapse in the compressed low-resolution online image smoothed and softened the sharp and irregular edges of the dark-beige adhesive patches attached to Mary Tyler Moore's body. The patches were further lightened and reduced into delicately rounded shapes that could be perceived as anatomical features of her breasts. Liquefaction also appeared to blend Moore's undergarment into her skin and transformed the undergarment to appear as a light shadow below her breasts. The overall visual outcome in low resolution is closer aesthetically to the Venus de Milo than to the actual undergarment worn in the higher resolution image. Similarly, in classical sculpture, the artist compresses human reality into an idealized form—smoothing away physical imperfections and extraneous details to reach a universally pure concept of the subject. Therefore, by smoothing the digital data to remove superfluous detail, materiality collapses in the MTM image, inadvertently performing an abstraction of classical nudity.

Indeed, compared to the softer low-resolution image suggesting nudity, the undergarment revealed in the higher-resolution DVD seems garish and aesthetically out of context within a bubble bath. Likewise, an image of the classic Venus de Milo wearing a brassiere would appear just as absurd as would Mary Tyler Moore appearing topless on television, implying that the controversial issue is not nudity alone but also the incongruity of the subject context. However, because compression algorithms do not evaluate contextual coherence, the resulting image simply reflects the mathematical priorities of data reduction rather than any awareness of the scene's narrative or cultural context.

Importantly, this machine-induced hallucination differs from both deepfakes and shallowfakes that involve human agency (Hodge, 2021). Shallowfakes rely on accessible editing tools used by humans to intentionally deceive, and humans create deepfakes by employing generative AI to fabricate plausible realities. By contrast, the MTM artifact is solely an unintentional mechanical illusion—a byproduct of technical efficiency in which the machine's internal logic reconstructed the human form by reducing data complexity. In this rare instance, a video compression artifact produced a visual outcome so deceptively coherent that it rivals an intentional forgery. However, the machine only appeared to mimic human agency because compression altered the visual cues on which viewers rely when interpreting what they see. The emergence of MTM's Venus de Milo form from the machine exemplifies the independent interaction between low-level algorithmic rules and high-level human visual interpretation. Interestingly, as bitrates increase and aggressive compression becomes less necessary, such artifacts may become increasingly rare—a short-lived phase in the advancement of online video formats.

A further dimension of materiality collapse in this case may involve the temporal instability of the exposure itself. Low-resolution encoders often rely on predictive frames that update only when visual information remains stable across time, which suggests that very brief exposures may not receive a full allocation of detail. Because Mary Tyler Moore's upright posture above the waterline lasted for only a fraction of a second before she returned to a submerged position, the encoder may have treated the moment as too transient to redraw with precision. Instead, the tonal regions appear to have been blended with adjacent frames in which her torso remained underwater. Had Moore held the upright position even slightly longer, the encoder might have refreshed the macroblocks in that region and produced a clearer representation of the undergarment. In this sense, the fleeting nature of the exposure likely amplified the boundary-dissolving effects of compression and contributed to the appearance of materiality collapse in the online version.

Although the MTM case is unusual in television media, similar interpretive challenges have been noted in other low-bitrate video media. For example, in surveillance-video investigations, aggressive compression can obscure small objects, blur motion, and degrade edge boundaries to the point that investigators cannot reliably distinguish facial features, license plate numbers, or other objects in a scene (fortsense.net, 2026). In these contexts, as in the MTM example, the loss of material boundaries arises not from intentional manipulation but from video compression, which prioritizes data reduction over visual fidelity. Such cases suggest that materiality collapse reflects a broader class of perceptual ambiguities that emerge when low-resolution encoding alters visual cues on which critical interpretation depends.

4.7. Implications and Summary

The findings of this paper suggest that online circulation of digital images compressed with algorithms such as H.264 can generate misleading interpretations, not because of intentional manipulation by humans but through the interaction of technological distortion and culturally familiar visual images. The present paper highlights several dynamics shaping contemporary television as it moves from analog to digital platforms. A moment that originated in a traditional analog broadcast stands out as a digital artifact, demonstrating how the migration of television content into online platforms subjects original content to new encoding and lossy compression processes that reduce file size by discarding visual information. As Manovich argued in his book *Software Takes Command* (Manovich, 2013), software transforms cultural media by defining its properties through interfaces, operations, and algorithms rather than the underlying data alone. These software-driven

processes materially transform the image and redefine the internal structure of the data, often producing visual forms and artifacts that were never part of the original signal.

In Mary Tyler Moore's case, the digital platform's recompression algorithm generated a semi-nude Venus de Milo form, a shape that was inconsistent with Moore's long-standing professionalism and ethical standards. This frustrating mismatch motivated the present media-archaeological investigation, which showed how the artifact emerged from technical distortion rather than from the broadcast itself.

Finally, while the present study focuses on a legacy television moment, the mechanism it identifies—materiality collapse—may have broader relevance for understanding how low-resolution digital media shape public perception of ambiguous visual material. This problem warrants further attention, particularly as online compressed images of material evidence shape public judgments and decisions. Material evidence is only as trustworthy as the materiality of the digital artifact that supports it.

5. Conclusions

This paper demonstrates that Mary Tyler Moore's apparent wardrobe malfunction in a digital online bubble-bath clip is the result of a video compression artifact produced by the platform's encoding algorithm. By investigating the technical and contextual conditions that generated her Venus de Milo form and comparing them with her established professionalism and on-screen conduct, this media archaeology analysis shows how video compression can induce materiality collapse and create erroneous perceptual cues. The paper suggests that such distorted images should be carefully scrutinised when used to support claims about legacy television events and other material evidence posted online in low-resolution compression formats.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: No new data were created or analyzed in this study. Data sharing is not applicable to this article.

Conflicts of Interest: The author declares no conflicts of interest.

Abbreviations

The following abbreviations are used in this manuscript:

AVC	Advanced Video Coding (H.264)
CBS	Columbia Broadcasting System
DVD	Digital Video Disc
HD	High Definition
HPMC	Hydroxypropyl Methylcellulose
MTM	Mary Tyler Moore
MPEG-2	Moving Picture Experts Group- 2

References

- Athanasopoulou, E., Maurizzi, E., Bigi, F., Quartieri, A., Pulvirenti, A., & Tsironi, T. (2025). Comparative effect of different plasticizers on physicochemical properties of hydroxypropyl methyl cellulose (HPMC)-based films appropriate for gilthead seabream packaging. *Carbohydrate Polymer Technologies and Applications*, 10, 100839. [CrossRef]
- Bolter, J. D., & Grusin, R. (2000). *Remediation: Understanding new media*. MIT Press.
- Caswell, M. (2023). 'The archive' is not an archives: Acknowledging the intellectual contributions of archival studies. In A. Prescott, & A. Wiggins (Eds.), *Archives: Power, truth, and fiction*. Oxford University Press. [CrossRef]

- Classic Films & Serials Now! (1976). *The Mary Tyler Moore show, season 7, episode 11, Mary's insomnia*. MTM Enterprises.
- Ernst, W. (2013). *Digital memory and the archive*. University of Minnesota Press. Available online: <http://www.jstor.org/stable/10.5749/j.ctt32bcwb> (accessed on 15 March 2026).
- fortsense.net. (2026). *Mitigating compression artifacts for reliable investigative video quality*. Available online: <https://fortsense.net/blog/compression-artifacts-and-investigative-video-quality> (accessed on 20 June 2026).
- Gennes, P.-G., Brochard-Wyart, F., & Quéré, D. (2004). *Capillarity and wetting phenomena: Drops, bubbles, pearls, waves*. Springer.
- Glaser, B. G. (2002). Conceptualization: On theory and theorizing using grounded theory. *International Journal of Qualitative Methods*, 1(2), 23–38. [CrossRef]
- Grandmont, J. (2011). *Vénus de milo*. Available online: https://commons.wikimedia.org/wiki/File:0_V%C3%A9nus_de_Milo_-_Ma_399_-_Louvre_2.JPG (accessed on 21 May 2026).
- Hine, C. (2000). *Virtual ethnography*. SAGE Publications Ltd. [CrossRef]
- Hodge, S. D., Jr. (2021). Don't always believe what you see: Shallowfake and deepfake media has altered the perception of reality. *Hofstra Law Review*, 50, 4.
- Huhtamo, E., & Parikka, J. (2011). *Media archaeology: Approaches, applications, and implications*. University of California Press.
- Jensen, K. B. (2002). *A handbook of media and communication research*. Routledge.
- Jouki, M., Khazaei, N., Ghasemlou, M., & Hadinezhad, M. (2013). Effect of glycerol concentration on edible film production from cress seed carbohydrate gum. *Carbohydrate Polymers*, 96(1), 39–46. [CrossRef]
- MacCallum, F., & Widdows, H. (2018). Altered images: Understanding the influence of unrealistic images and beauty aspirations. *Health Care Analysis*, 26(3), 235–245. [CrossRef] [PubMed]
- Manovich, L. (2013). *Software takes command*. Bloomsbury Academic.
- Miller, M. A. (2025). *Rehearsal: On-camera vs. theatre*. Available online: <https://www.actingsstudiochicago.com/rehearsal-on-camera-vs-theatre/> (accessed on 8 March 2026).
- Moore, M. T. (1995). *After all*. G.P. Putnam's Sons.
- Nasatto, P. L., Pignon, F., Silveira, J. L. M., Duarte, M. E. R., Nosedá, M. D., & Rinaudo, M. (2015). Methylcellulose, a cellulose derivative with original physical properties and extended applications. *Polymers*, 7(5), 777–803. [CrossRef]
- National Research Council. (2015). Chapter: 3 Cognitive biases. In *Measuring human capabilities: An agenda for basic research on the assessment of individual and group performance potential for military accession*. National Academies Press.
- Parikka, J. (2012). *What is media archaeology?* Polity Press.
- Poynton, C. A. (2012). *Digital video and HD: Algorithms and interfaces* (2nd ed.). Morgan Kaufmann. Available online: https://www.academia.edu/44523028/DigitalVideo_andHDTV_Algorithms_andInterfaces_CharlesPoynton (accessed on 7 July 2026).
- Richardson, I. E. (2011). *The H. 264 advanced video compression standard*. John Wiley & Sons.
- Spigel, L. (1992). *Make room for TV: Television and the family ideal in postwar America*. University of Chicago Press.
- Storey, J. (2024). *Cultural theory and popular culture: An introduction* (10th ed.). Routledge.
- Television as digital media*. (2011). Duke University Press. [CrossRef]
- The Dick Van Dyke Show. (1965). *Season season 4, episode no. 27, episode 27*. Calvada Productions. Available online: <https://www.youtube.com/watch?v=0fPNkh2BYbU> (accessed on 7 July 2026).
- Twentieth Century Fox Home Entertainment. (2010). *The Mary Tyler Moore show: The complete seventh season*. MTM Enterprises.
- Unterweger, A. (2013). Compression artifacts in modern video coding and state-of-the-art means of compensation. In R. A. Farrugia, & C. J. Debono (Eds.), *Multimedia networking and coding* (pp. 28–49). IGI Global Scientific Publishing. [CrossRef]
- Wiegand, T., Sullivan, G. J., Bjontegaard, G., & Luthra, A. (2003). Overview of the H. 264/AVC video coding standard. *IEEE Transactions on Circuits and Systems for Video Technology*, 13(7), 560–576. [CrossRef]
- Winkler, S. (2005). *Digital video quality: Vision models and metrics*. John Wiley & Sons. [CrossRef]
- Zeng, K., Zhao, T., Rehman, A., & Wang, Z. (2014). *Characterizing perceptual artifacts in compressed video streams* (Vol. 9014). SPIE. [CrossRef]

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.