Which Way Did He Go?

Directionality of Film Character and Camera Movement

and Subsequent Spectator Interpretation

by
Matthew L. Egizii
Ssj4sg2@gmail.com

James Denny, M.A.
jtldenny@msn.com

Kimberly A. Neuendorf, Ph.D.
k.neuendorf@comcast.net

Paul D. Skalski, Ph.D.
p.skalski@csuohio.edu

Rachel Campbell
Rachelcampbell2@gmail.com

All at:

School of Communication
Cleveland State University
Cleveland, OH 44115

Paper submitted for possible presentation to the Visual Communication Division of the

International Communication Association at the annual conference, Phoenix, AZ, May 2012

Which Way Did He Go?

Directionality of Film Character and Camera Movement

and Subsequent Spectator Interpretation

Abstract

Elements of on-screen motion hold specific meanings and contexts depending on their usage. This study focuses on how a film viewer interprets lateral motion from left-to-right and from right-to-left. A posttest only experimental design used previously existing footage from a short film to test movement in one of these two directions. Participants answered a short questionnaire after watching the sequence and answered items concerning affective and perceptual evaluations of the sequence. Data were also collected about factors the researchers suspected were possible causes for the effect, including religion, psychometrics, recall, media use, and handedness. After performing a factor analysis, an ANOVA showed a significant relationship between viewer evaluations on the Negative Affect factor and the two experimental conditions, such that right-to-left motion was perceived more negatively. Additionally the study found no support for explanations by religion, handedness, recall or the psychometric items (except for psychoticism).

Which Way Did He Go?

Directionality of Film Character and Camera Movement

and Subsequent Spectator Interpretation

Introduction

Despite a long tradition of critical scholarship on film, scholars are becoming increasingly interested in the scientific study of the medium. The Society for Cognitive Studies of the Moving Image, for example, emerged in the late-1990s to promote empirical approaches to the study of film and other moving image media, and recent research has answered the call by investigating moving image phenomena from both quantitative and qualitative scientific perspectives (e.g., Lieberman, Neuendorf, Denny, Skalski, & Wang, 2009). Despite this emerging trend, there remain many unanswered questions about why film has such power over audiences. Furthermore, many techniques regularly employed by filmmakers and discussed in the critical literature have yet to be subjected to empirical testing.

This paper considers how directionality of film character and camera movement affect subsequent spectator interpretation. It reviews the literature on left to right and right to left movement in film and predicts that audiences will respond differently to film content in which movement occurs in the two different directions. The paper then presents the results of an experiment testing predictions and discusses the findings in light of the film literature and implications of this research for film and other moving image scholars.

The Significance of Film Production Techniques

Film language includes key dimensions that do not necessarily have anything to do with the dialogue written for a film, or with what language a film's characters might

actually be speaking within the movie. In fact, this language of film was in great part developed prior to the talkies (Eisenstein, 1949/1977), and stems from the use of various production and post-production techniques, movements, and other elements that can help establish meaning or elicit emotion within viewers (Bordwell, Staiger, & Thompson, 1985; Salomon, 1987). An analysis of such language has been largely the province of semiotic analyses, without empirical tests of prevalence or spectator response (Metz, 1974; Peters, 1981; Stam, Burgoyne, & Flitterman-Lewis, 1992; for coverage of semiotics in general, see also Eco, 1976).

The French term mise en scene is used to describe how filmmakers utilize the placement of objects and characters within the frame in order to help establish meaning for the audience (Giannetti, 2011; Phillips, 2005). Also, the manner in which a scene in a film is edited can lead to an emotional response from the audience (Cook, 2004). In editing, one image is replaced instantaneously on the screen by another image, and those two images in succession may trigger emotional responses from the audience that might not be elicited from either image alone (Kuleshov, 1974). Dick (2005) points out that one shot in a film can acquire meaning from a second shot when the two shots are linked together in instantaneous succession with one another.

Just as the careful design of the mise en scene and evocative editing can affect meaning and the spectator's psychological interpretation of what they are seeing within a film, character movement on the screen can be important in helping an audience member determine the meaning of events within a story as well (Giannetti, 2011). Often this interpretation of character movement can occur without the viewers even realizing why they have come to that determination of meaning, but certainly movement on the screen

is a part of the language of film that audience members might either consciously or subconsciously understand.

For instance, movement upwards or downwards on the screen is seen as having potential impact upon the spectator's psychological interpretation of a character (Giannetti, 2011). Giannetti posits that onscreen movement in an upward direction can make a character seem stronger or more dominant, while downward movement of a character can be construed by the audience as a character being weaker or subservient. Kuleshov (1974) goes even further in his assessment of the impact of vertical movement, suggesting that quicker vertical movement in the upward direction can be interpreted by the audience as a character having strength, while slower upward movement toward the top of the frame can signify that a character is weaker. Similarly, Kuleshov points out that quicker downward movement by a character can be interpreted as he or she possessing weakness, while slower movement toward the bottom of the frame can be seen as a character being stronger. Thus, the combination of speed of character movement and direction of character movement might actually interact with one another to create a general statement about a screen character's strength or lack thereof. The vertical movement through screen space is just one of three axes of movement as laid out by Kuleshov. A second axis is movement toward or away from the camera lens and ultimately the viewer.

Eisenstein (1942/1975) describes the movement away from the lens as "a spatial movement towards the horizon, or into the depth" (p. 204). Psychologically, character movement away from the camera can infer that a character is withdrawing or is distancing his or herself emotionally from us, and any emotional intensity will generally decrease (Giannetti, 2011). If a villain in a film moves away from the lens, according to

Giannetti, a "protective distance" is formed between the villain and the audience; thus the audience will feel some sense of relief.

Movement along that same axis toward the camera, however, will generate a very different feeling in the viewer. Giannetti (2011) argues that the spectator will perceive a character's movement towards the lens as he or she being aggressive, or in the case of a movie villain moving closer to the camera, he or she might be seen as "hostile or threatening" by the viewer. Thus, according to film theorists, scholars and creators, character movement within the frame along two of the axes of screen movement, as described by Kuleshov (1974), can impact the spectator psychologically.

Left to Right and Right to Left Movement

Kuleshov (1974) describes a third axis of character movement as the lateral movement of a character across the screen, either from the left side of the screen to the right side, or movement from the right side of the screen toward the left side. He explains that movement along any line of action set at an oblique angle to these three axes can be more difficult or more of a strain for viewers to interpret, but that lateral movement along this third axis is more distinct to an audience and is consequently easier for audience members to follow. Though Kuleshov labels such lateral movement as more distinct, or less complex in terms of audience understanding, is it possible that aspects of this lateral movement might still offer viewers some latent meaning? When looking at character movement along either of Kuleshov's other two axes of screen movement, it was speculated that the direction in which a character is moving along those two axes would completely alter the interpretation of the character by the audience (Giannetti, 2011). Might opposing lateral directions of movement also have a similar impact on the audience?

A surprising number of scholars have addressed the notion of motion within the film frame, but without weighing in on the possible differences in left to right motion vs. right to left (e.g., Arnheim, 1957; Kracauer, 1960; Salt, 2009). Some film scholars do argue that character movement from left to right does have a different emotional impact on viewers than does movement from right to left (Giannetti, 2011). Some filmmakers also realize the importance of action moving from the left to the right versus from the right to the left. Early Soviet filmmaker Sergei Eisenstein argues that in art, the artist can control the "path of the eye" of the observer, meaning that the artist can visually draw an observer's eye to a specific point on the canvas and dictate which direction the eye then travels over the painting as it takes the work in as a whole (Eisenstein, 1942/1975). This is done through the careful composition and placement of the painting's subjects on the canvas.

Eisenstein (1942/1975) believed that filmmakers have that same ability to control the "path of the eye" of the audience as it travels across the screen. Though Eisenstein realized that movement can progress in any direction that an artist desires, in a pivotal sequence from his 1938 film *Alexander Nevsky*, in which the Russian troops are about to take part in the famed "Battle On the Ice" sequence, Eisenstein specifically chooses to lead the spectator's eye from screen left to screen right. Eisenstein writes, "So these separate movements of the eye from left to right throughout the sequence add up to a feeling of something on the left, striving 'with all its soul' in a direction somewhere to the right" (p. 200).

Furthermore, camera movement is another manner in which screen motion, and perhaps meaning, is manifested (Bacher, 1976; Giannetti, 1975), in the form of pans or lateral tracking shots. Whether it is character movement or camera movement, the idea

that motion within the film frame is crucial and can be meaningful has been advanced by leading film scholars (Arnheim, 1957; Kracauer, 1960). Often a character's lateral movement is captured by a camera panning in the same lateral direction (Giannetti, 2011). O'Leary (2003) calls this type of panning shot a "pan of accompaniment." Yet, no confirmatory studies have gauged the impact of this consonant type of camera movement. In a rare empirical, quantitative investigation, Salt (2009) conducted a content analysis of form techniques in 20 selected films released in 1999, and while he measured each pan and lateral tracking shot, he did not measure whether the motion occurred left to right or right to left.

In a content analysis of 20 films directed by Howard Hawks, O'Leary (2003) notes that the director dramatically favors panning from left to right, with 64% of all pans moving in that direction (a statistically significant difference). Hawks is not alone, as two different analyses of both older and newer Hollywood films suggest. O'Leary examined 20 selected classic Hollywood films and found pans to the right outnumbered pans to the left by a ratio of 115 to 74. Salt (2005) looked at Hollywood films from 1995 on and found that directors often favor the left to right direction in unmotivated camera movements (i.e., those not following the motion of a character), though this tendency may be somewhat limited, as indicated by the underwhelming ratio of 649 to 592 (Salt, 2005). Still, an inclination toward rightward camera movement is apparent, and it must be asked why this preference for one lateral direction exists over the other.

Salt (2005) argues that the predominance of human right-handedness and right-footedness might serve as an explanation for this rightward favoritism. Salt writes, "Such physical tendencies can be expected to carry through to camera operating, since a pan to the right is more readily made by a right-handed person, because the required clockwise

rotation of the panning wheel on a geared head is more natural to a right-handed person

than the anticlockwise turn required to pan left" (p. 103). The argument for right-handed

aesthetical rules being developed in the arts due to the larger population of people who

favor their right hand is not a new one. In classical art, it is widely assumed that the

source of light often originates somewhere toward the upper left portion of the canvas,

because this makes it easier for right-handed artists to paint the effects of this light on the

right-hand side of their work (Gombrich, 1989). Might this adherence toward right-

handedness seen in camera operation and classical art ultimately and perhaps

unknowingly compel film directors to move their characters from the left to the right, or

pan predominantly from left to right, or is there something more to this choice of

direction along the lateral axis? Can a director convey an unspoken meaning about a

character and that character's situation by having them move from left to right or vice

versa?

     Film directors may base their decision as to whether a character should move

from left to right or from right to left across a screen on a rule that is rarely written or

spoken about, which claims that character movement from the left of the screen toward

the right of the screen is perceived by the audience as normal or natural (Giannetti, 2011).

The opposite is thought to be true of character movement from the right side of the frame

to the left. It is conjectured that lateral movement in the leftward direction is perceived as

unnatural or even uncomfortable, or perhaps even that a person moving in that direction

is struggling. Exactly why an audience supposedly senses either naturalness or tension

due to a difference in the direction of lateral movement is a matter that is up for debate,

though Giannetti writes that it is "because the eye tends to read a picture from left to

right…" (p. 95). Also, when reading text, people in Western culture have this same

tendency to read from left to right since most Western culture language is presented horizontally in that direction (Bonfiglioli, 2011; Casasanto, 2009), thus movement in this direction seems more natural.

Also, the side of the screen on which a character resides in a scene may provide further insight into why movement from the left to right is seen as positive or natural. When discussing Alfred Hitchcock, Ebert (2004) states, "He always used the convention that the left side of the screen is for evil and/or weaker characters, while the right is for characters who are either good, or temporarily dominant." For this reason, a character who is good, and is on the left, or "evil" side of the screen should strive to laterally move to the right side of the screen, and this movement could be perceived as positive or natural, while the opposite feelings will be experienced by an audience witnessing a character moving from the right or good side of the screen toward the left or evil side.

This notion of objects located to one's left being bad, and objects placed on a person's right being good, may again tie into the predominant right-handedness of the world's population (Casasanto, 2009). Research has shown that people have the tendency to favor the side of their dominant hand. Since left-handers make up such a small percentage of the overall population, it is possible that a right-dominant world exists, where the right side is "right" and the left side is wrong, which has been supported across numerous empirical studies (Casasanto, 2009). If Ebert's (2004) suggestion is correct, and Hitchcock does adhere to this left to right rule of character movement, it is important to look at this rule in practice.

Case Examples of the Left to Right Rule: Strangers on a Train and Lola rennt

Anecdotal evidence contained in Hitchcock's 1951 film *Strangers on a Train* seems to indicate that at least some directors do make a conscious choice when

determining the direction of a character's movement across the screen. A director can do this to convey greater meaning toward a character's psychological state or the situation in which the character finds his or herself.

In *Strangers on a Train* (1951), before the audience even sees the faces of any of the characters, Hitchcock introduces us to the film's protagonist and antagonist in a series of shots where he shows only their legs and feet walking, with the characters moving in opposite lateral directions, effectively telling the audience that these two people will eventually cross paths or may come into conflict with one another. In this sequence, each time we see a plain pair of dress shoes and slacks, which we soon learn belong to the film's protagonist, the handsome and likeable Guy Haines, they are seen walking from left to right. In the meantime, the very distinct two-tone shoes and pinstriped pants of the antagonist, the smooth and charming sociopath Bruno Antony, are always seen traveling from right to left. If the audience does consciously or subconsciously perceive movement from the left to the right as natural, and movement from the right to the left as uncomfortable, then this can speak volumes about each of the two characters before we even become familiar with them. Guy is the protagonist, and is moving in a direction in which we are comfortable and find acceptable, while Bruno, the antagonist, is moving in a direction that we deem uncomfortable, meaning we may already realize that something is not quite right about him, which could be exactly what Hitchcock is trying to convey to his audience (although Hitchcock himself did not profess to any intentionality in this regard; Auiler, 1999).

Lateral movement in either direction is also argued to be more decisive than movement to or away from the camera (Giannetti, 2011). Giannetti states that a character seen moving from left to right or right to left across the screen is seen as a character of

action due to the speed of the motion across the lens, unless, of course, that horizontal movement is captured using an extreme long shot, where the action of crossing the frame would require a longer amount of time. In Tom Tykwer's 1998 film *Lola rennt*, the movie's protagonist, Lola, is definitely a person of action. An anecdotal analysis of this film suggests the different rules of character movement along the lateral axis seem to be utilized by the director.

In *Lola rennt* (1998), Lola has received a phone call from her boyfriend Manny notifying her that he is in grave danger. He has lost 100,000 Deutschmarks that belong to his gangster boss, and needs to replace this money within the next 20 minutes. In three separate 20-minute segments, the audience is then treated to three alternative realities, seeing Lola desperately try to get Manny this money. In each segment, Lola tries a different approach, all which involve her running across town to reach Manny, and in each version of events a different outcome occurs. In the first segment, Lola, an action-oriented and decisive person, is shown primarily running from right to left for much of the 20 minutes. She tries to borrow the money from her father, the president of a bank, only to be turned down, and arrives slightly late to find Manny holding up a grocery store. She joins him in the robbery, and they run off with the stolen money, only to have Lola shot by a police officer.

The second segment features a different attempt by Lola, starting at the same point in time that the first segment had started, Lola again runs across town to Manny, again in the right to left direction. This time she robs her father's bank at gunpoint, escapes with the money, arrives in time to stop Manny from robbing the grocery store, but this time Manny is hit by an ambulance as he crosses the street to meet Lola.

In the third segment, we once again start back at the beginning Lola again must raise the money and get to Manny before the 20 minutes expire. Lola starts out by running once again to the bank, in a right to left direction, but this time misses her father by a minute. She then, for the first time, places her faith in something other than herself. While running from the left to the right for the first extended period of time in the film, Lola prays for some sign that will help her procure the money that Manny needs. It is after running in this seemingly positive direction that she is stopped suddenly by a car horn, looks up, and sees a casino. She takes this as her sign from above, enters the casino and proceeds to win the 100,000 Deutschmarks. Manny also finds the original bag of money he lost, and both he and Lola end the film 100,000 Deutschmarks ahead. It seems likely that Tykwer was aware that extensive left to right character movement should be reserved for Lola for the moment when she places her faith in God, and goes about getting the money in a socially acceptable way.

Religious Implications of Left to Right Movement

If, as Ebert (2004) suggested, the right side is "good" and the left side is "evil," is it merely due to the dominance of right-handedness in the world, or is there something more that might lead people to believe in this assertion? When looking at the left-right issue as it is discussed in the Christian faith, the right is the side reserved for those people who Jesus will select to go to heaven, while those on the left will remain behind.

> And before him shall be gathered all nations: and he shall separate them one from another, as a shepherd divideth his sheep from the goats: And he shall set the sheep on his right hand, but the goats on the left. Then shall the King say unto them on his right hand, Come, ye blessed of my Father, inherit the kingdom

prepared for you from the foundation of the world (Holy Bible, King James

Version, p. 39)

Yet again, the right side seems to be favored over the left, and passages such as these

from the Christian faith might help to account for this notion that the left is the

undesirable, thus rightward movement for anyone should be the ultimate goal.

Research Questions

Based on literature outlining cultural and perceptual differences in left/right

directionality, we pose the following three research questions:

RQ1: Will individual viewers attribute evaluations differently when observing

movement in film from either left to right or right to left?

RQ2: Do Western religious beliefs affect viewer evaluations of the directional

lateral movement in a film sequence?

RQ3: Does handedness (left-handed or right-handed, or ambidexterity) affect

viewer evaluations of the directional lateral movement in a film sequence?

In an exploratory vein, we question whether key psychometrics will moderate the

impact of directional lateral movement:

RQ4: Do the major psychometric indicators examined in this study (i.e.,

psychoticism, neuroticism, extraversion, openness to experience, and need for cognition)

affect viewer evaluations of the lateral movement in a film sequence?

Finally, we seek to discover whether directionality of lateral motion in a film

sequence will be accurately recalled by spectators:

RQ5: Will viewers recall lateral character motion and lateral/panning camera

motion as being in the proper direction?

Methods

Experimental Stimuli

Selected footage from a short narrative 16mm film was utilized to construct a 55-second sequence highlighting character and camera lateral motion. In one version, all lateral motion was from left to right. In a second version, the "flop" option in Avid Composer was used to simply switch the direction of all shots in the sequence—i.e., all lateral motion in this version was from right to left. This electronic transform assures that the sequences are perfect mirror images of one another. Both versions of the film sequence were silent.

The sequence was comprised of the following shots in the left to right version:

1. An exterior establishing long shot (LS) of a suburban house, with camera tracking motion from left to right.

2. An interior LS of a woman working at a computer at a dining room table near three windows, shot from behind.

3. An interior panning shot, from left to right, from inside the dining room, following a man furtively passing the series of three windows; the camera catches brief glimpses of him as he passes from left to right.

4. An interior close-up of the woman on the left side of the frame, shot from behind, as she turns her head to the right.

5. In an interior LS, the camera follows the woman as she rises and exits the dining room, from left to right.

6. In an interior LS, the camera captures the woman as she exits the back door, and stands on the porch looking at the backyard.

7. An exterior CU of the woman as she looks across the backyard, with her eyes tracking from left to right.

8. An exterior POV shot of the woman's perspective, as she pans across the backyard, from left to right, ostensibly looking for the man.

Validity of Stimulus Material

Our intention in using previously existing footage from a short film was to keep the external validity in this experiment high, while still being implemented in a controlled fashion. The sequence had no logos or text (which would immediately call attention to the manipulation), and it was crafted from portions of a previously existing film, as a means of enhancing respondent belief in the image.

Experimental Protocol

Participants were recruited from Communication courses at a medium-sized urban university. The study was executed using Media Lab software, with viewing on standard desktop computer screens. In a posttest-only design, each participant viewed one version of the stimulus film sequence, with random assignment. After the viewing, participants responded to a series of questions on the computer via Media Lab. The protocol and the measurement instrument were approved by the university's IRB.

Measures

A background questionnaire was administered via Media Lab prior to the experimental manipulation. This questionnaire included (a) measures of standard demographics (but also including left-handedness vs. right-handedness); (b) exposure indicators for a variety of relevant media (including hours of television viewing "yesterday," number of DVDs/videos viewed in the

past month, number of movies seen at a theater in the last month, estimate of percentage of TV viewing done alone, and hours spent on the Internet daily); and (c) several psychometric indicators—short scales for the measurement of psychoticism, extraversion, and neuroticism (Eysenck, Eysenck, & Barrett, 1985), the John, Donahue, and Kentle (1991) scale for the measurement of openness to experience, and the Need for Cognition scale (Cacioppo, Petty, & Kao, 1984).

In the Media Lab posttest, open-ended and closed-ended questions tapped a range of concepts relevant to lateral motion differentiation. An open-ended recall question asked respondents to describe in as much detail as possible what was going on in the film sequence. A second open-ended item asked how the video made the respondents feel. Responses to each of the two open-ended questions were coded for (1) number of words used, and (2) number of discrete thoughts generated. The recall item was further coded for (3) number of objects mentioned, (4) number of physical actions identified, (5) number of production techniques (e.g., pans, tracking shots) mentioned, (6) any mention of lateral motion, and (7) whether there was mention of an assumption of positive or negative intentions on the part of the male character (who might have been seen as "creeping" around the back of the house). The open-ended item tapping emotional response was further coded for (3) number of critical comments, and (4) discrete feelings/emotional responses mentioned, from a code list of 38 possible emotions generated from existing literature (Ekman & Friesen, 1971) and categories generated inductively from respondent data (e.g., "worried," "suspicious," "uncomfortable").

Following the open-ended questions, a series of 17 closed-ended items tapped affective and perceptual dimensions representing the basic categories of stimulus differentiation (from Osgood, Suci, & Tannenbaum, 1957) and related to traditional cultural and popular interpretations of the symbolic meaning of left and right (Casasanto, 2009; Palka, 2002;

www.whats-your-sign.com/symbolic-hand-meaning.html;

http://boards.straightdope.com/sdmb/showthread.php?t=359438). These 17 evaluative indicators

may be found in Table 1.

Further, each respondent was asked to recall whether the characters' motions were shown

as moving from left to right, or from right to left. And, each was asked to recall whether camera

motion was from left to right, or from right to left. Both items were closed-ended.

Results

Description of Sample

The sample of 101 undergraduates was 52.5% male, ranging in age from 18 to 54, with a

mean of 25.3 years. Just under two-thirds of the sample was white/Caucasian (64.0%), with

26.0% black/African-American, 3.0% Asian-American, and 7.0% other or of mixed race. The

proportion of respondents who indicated they were left-handed was 10.9%, with 88.1% right-

handed, and 1.0% ambidextrous.

The participants reported watching an average of 2.28 hours of TV "yesterday"

(*SD*=2.23), listening to 0.93 hours of radio "yesterday" (*SD*=1.43), reading the newspaper 1.54

days in the past week (*SD*=1.83), reading 1.30 magazines regularly (*SD*=1.55), reading 3.93

books in the past six months (*SD*=5.22), watching 1.55 movies at the theater in the past month

(*SD*=2.51), and watching 8.52 movies via DVD/BluRay/video/DVR in the past month

(*SD*=8.15). They estimated that, on average, 52.5% of their TV viewing was done alone

(*SD*=32.82).

The sample reported watching news for an average of 53.46 minutes on TV or the

Internet (*SD*=73.20), reading news for an average of 35.94 minutes in newspapers, magazines, or

online (*SD*=45.06), and listening to news for an average of 28.68 minutes on radio or the Internet (*SD*=57.60).

The sample's average reported time on the Internet "yesterday" was 2.50 hours (*SD*=1.94), with 1.29 hours of that time spent social networking (*SD*=2.34). On average, they reported sending 5.22 emails "yesterday," although these estimates varied greatly (*SD*=29.78).

On average, the respondents reported playing video games alone for 38.58 minutes during an average weekday (*SD*=108.60). They reported playing video games with others for 24.06 minutes on an average weekday (*SD*=48.00).

When responding to the first open-ended item concerning the film stimulus, that asking respondents to described the content in as much detail as possible, the responses generated averaged 4.37 discrete thoughts (*SD*=2.65), using an average of 57.98 words (*SD*= 40.40). On average, the descriptions referenced 11.67 objects (*SD*=6.31), 8.11 unique objects (*SD*=4.25), 5.45 actions (*SD*=2.61), and 1.62 production techniques (*SD*=1.98).

Character or camera movement was mentioned by 85.1% of respondents, although the direction of that movement was indicated by only 10.9% (i.e., 74.3% mentioned movement, with no lateral direction specified). There were negative assumptions made about the intentions of the male character in the film sequence by 57.4% of respondents, with 18.8% making some type of neutral assumption; only one respondent (1.0%) made positive assumptions, with 22.8% providing no evidence of assumptions about character intentionality.

With regard to the second open-ended query, that asking respondents how the film sequence made them feel, participants responded with an average of 1.36 thoughts (*SD*=0.72) using 8.31 words (*SD*=13.18). They posed an average of only 0.16 critical comments (*SD*=0.37). The most common emotional responses cited in this item were

anxious/nervous/uneasy/suspenseful (24.8%), fearful/frightened/scared (11.9%), and curious (9.9%).

Analyses for RQ1: Simple Effects of Directional Movement

From our set of evaluative measures (17 semantic differentials) we conducted a VARIMAX orthogonally rotated factor analysis which yielded six factors (see Table 1). These six factors are: Comfort/Safety, Negative Affect, Normalcy, Activity, "Id," and Superior. Each factor was labeled according to the highest loading items. All communalities and eigenvalues met standard criteria for acceptability.

------------Table 1 about here------------

Of the six factors, only Negative Affect was found to be significantly different between the two experimental conditions (left to right vs. right to left). Its principal loaders were: Didn't like the clip/Liked the clip, Good/Bad, Interesting/Boring, and Strong/Weak. From the literature we referenced, as well as the anecdotal evidence within films as mentioned above, this seems to fall into line with our suppositions. As shown in Table 2, a single-factor ANOVA revealed a statistically significant main effect for our two conditions ($p = .015$), with mean factor scores of L/R = -.253 and R/L = .230. Essentially this indicates that there is support for the concept of directionality as dictating affective viewer response, such that those viewing the right-to-left version of the stimulus had a stronger "Negative Affective" response than did those viewing the right-to-left version.

------------Table 2 about here------------

Analyses for RQs 2,3,and 4: Potential Moderators

We next performed several tests of between-subjects effects of these two conditions and several potential moderators of interest in an effort to determine alternative explanations to the experimental manipulation impact.

Religion was dummy coded into JudeoChristian (1) or Other (0), in order to account for suppositions regarding Western religion as a key motivator of this effect. As mentioned earlier, right and left hands are tied to positive and negative depictions in the Bible. A two-factor ANOVA was conducted with condition and JudeoChristian as the fixed factors, and the Negative Affect factor score as the dependent indicator. The main effect for condition remained significant ($p = .048$), while the main effect for JudeoChristian religion and the interaction term were both non-significant. Thus, differences in evaluation remain despite the use of religion as a control.

Our next test examined left-/right-handedness in a similar manner. As noted above, we had a small sample of left-handed respondents (10.9%), which was expected and is indicative of the population. Once again, the main effect for handedness, and the interaction term between handedness and the experimental manipulation, were both non-significant. In this analysis, however, the main effect for the manipulation was reduced to non-significance as well ($p = .172$).

Tests for most of the psychometric indicators (extraversion, neuroticism, openness to experience, and need for cognition) found no significant impact, either direct or moderating. However, as shown in Table 3, psychoticism, re-coded into a median split (High/Low), provided a significant main effect ($p = .029$). The interaction term was not significant ($p = .708$), while the main effect for the experimental manipulation retained significance ($p = .028$). Thus, psychoticism is found to be an important predictor of affective reactions to the film sequence (Factor 2), regardless of condition; and, the impact of condition remains important even when controlling for psychoticism.

------------Table 3 about here------------

Analyses for RQ5: Directional Recall

Tables 4 And 5 show the number of responses, by condition, to the questions: "Which direction were the characters moving?" and "Which direction was the camera moving?" Overall, 83% of respondents were correct for the first question, and 85% for the second. So, the strong majority of spectators were able to correctly recall the directionality of both character and camera movement. Further breakdowns by handedness not shown in the table identified a slight deficiency among left-handed respondents in identifying left to right motion—only 40% were correct for character movement, and 60% for camera movement. However, due to the extremely small n's for this analysis, a test of statistical significance was not warranted.

Additional Analyses: Open-Ended Codings

------------Tables 4 & 5 about here------------

In a series of exploratory analyses, the two open ended items ("Please describe the clip you just viewed in as much detail as possible" and "How did the clip make you feel?") were coded for the series of descriptive indicators described earlier, and these were then tested against the Need for Cognition scale and the experimental manipulation. For the first item, tapping overall recall, there were no significant differences between conditions, nor any significant relationships with Need for Cognition. The second question, asking about emotional response, did manage to yield one significant item: Number of Words ($p = .030$), with respondents in the left to right condition producing more words, but strangely enough not more thoughts. One interpretation of this relationship is that participants felt freer to expound upon their reaction to the clip, which was an effect not expected by the researchers.

Discussion

This study focused on a topic of film production that has been taught as fact, but is mired in speculation and myth (Ebert, 2004; Salt, 2005). The challenge here was not just finding research that had been done, but in fact in finding any citation whatsoever regarding the origin of this phenomenon (Giannetti, 2011). The results of this study show support for differing evaluations among viewers regarding the direction of lateral movement, which is definitely an important step in understanding not only effects in motion pictures production and planning, but also as a mean of understanding the underlying messages inherent within any visual communication.

This study, then, is a step along the path to providing quantitative, empirical support to phenomena that have heretofore been examined via other modes such as semiotics (Eco, 1976; Metz, 1974). This convergence of critical cultural and empirical quantitative perspectives is rarely found in film studies, and is a much needed confluence in the scholarly literature.

The results reported here fit well with the anecdotal film evidence presented earlier. The primacy of the "right" hand is often repeated in popular culture, and the films themselves reflect this perspective. For example, an important monologue from the classic film *Night of the Hunter* (1955) overtly describes this belief structure:

> Would you like me to tell you the little story of right hand left hand? The story
>
> of good and evil? H-A-T-E…it was with this left hand that old brother Cain
>
> struck the blow that laid his brother low. L-O-V-E…you see these fingers,
>
> dear hearts? These fingers has veins that run straight to the soul of man. The
>
> right hand, friends, the hand of love.

As to causation, this study refutes several underlying myths associated with this effect. Some religions have held (perhaps only in passing discussion) that the right hand is

that of good, and the left hand is that of evil, and as such it seemed a natural fit into

understanding the underlying semiotics of directionality and affect. As it was found to be

non-significant, it is clearly not the most direct influence but it may have effects on a more

cultural level. This main effect should hold with non-Western cultures as well (Casasanto,

2009). As the vast majority of people worldwide are naturally right handed, the tendency is

for cultural products, religion and other emergent social systems to be congruent with this

biological tendency.

This tendency is as old as the oldest recorded religion and as new as the hottest

current media technologies. For example, a number of video games have featured left to

right movement as the dominant direction. The Atari 2600 game *Pitfall!* (1982) pioneered the

popular side-scrolling platform genre in which the main character "is seen from the side and

typically moves from left to right as the background and structures continuously appear on

the right and disappear on the left" (Montfort & Bogost, 2009, p. 107). *Pitfall!* was followed

by other platform games which also features scrolling left to right movement, such as the

iconic, mega-selling *Super Mario Bros*. "Horizontal scroll" was a common aesthetic feature

of games in the 80s, according to Nielsen, Smith, and Tosca (2008), who describe titles that

feature it as ones in which "the player character would fight his way from left to right, by

either battling or avoiding opponents" (p. 119). The dominance of left to right over right-to-

left in video games seems confirmed both anecdotally (through popular examples such as

Pitfall!, Super Mario Bros., and their kin) and through the descriptions of games offered in

scholarly works on the medium, which reference left to right movement. To date, no research

has directly tested the effects of left to right versus right to left movement on players, but

games likely follow the left to right pattern for many of the reasons discussed in this paper.

Therefore, we would expect the findings of the present study to be similar, if not more

pronounced, with video game play, given the active control of players and likely disconcerting nature of having to actually move one's character from right to left (versus simply watching such movement).

Future Research

To supplement the findings above, further research may be necessary. Initially, a content analytic approach to observing movement could be taken, observing popular film; either in an ideographic sense by observing each film as its own unit, or by looking at a large sample of films and tracking trends of movement. Additionally there may be a need to over-sample left-handed respondents to improve accuracy, a flaw shared by others studying this distinction (Casasanto, 2009). Another direction indicated by the results that address RQ5 is the inclusion of presence measures to determine where the respondent places themselves within the filmic diegesis. Concerning our design, the first open-ended question, "Describe the clip you just watched in as much detail as possible," was designed to elicit specificity of recall, not elaboration (e.g., in accord with the elaboration likelihood model). Alternative measures would provide additional markers of cognitive outcomes.

Conclusion

In summation, our analyses showed that religion, handedness and most psychometrics did not make a difference with regard to the affective evaluations of film directionality. This seems to point to a universality of the primacy of the "right," that is robust and enduring. A consideration of this empirically observed phenomenon should be incorporated into future study and theory with regard to film and the moving image.

References

Agee, J. (Writer), Laughton, C. (Director), & Gregory, P. (Producer). (1955). *The night of the hunter* [Motion picture]. United States: United Artists.

Arnheim, R. (1957). *Film as art.* Berkeley, CA: University of California Press.

Auiler, D. (1999). *Hitchcock's notebooks.* New York: HarperEntertainment.

Bacher, L. (1976). *The mobile mise en scene: A critical analysis of the theory and practice of long-take camera movement in the narrative film.* Unpublished masters thesis, Wayne State University, Detroit, MI.

Bonfiglioli, C. (2011). Unconventional vertical word-order impairs reading. *Perception 40*(3), 373-376.

Bordwell, D., Staiger, J., & Thompson, K. (1985). *The classical Hollywood cinema: Film style & mode of production to 1960.* New York: Columbia University Press.

Cacioppo, J. T., Petty, R. E., & Kao, C. F. (1984). The efficient assessment of need for cognition. *Journal of Personality Assessment*, *48*, 306-307.

Casasanto, D. (2009). Embodiment of abstract concepts: Good and bad in right- and left-handers. *Journal of Experimental Psychology-General*, *138*, 351-367.

Cook, D. A. (2004). *A history of narrative film* (4th ed.). New York: W.W. Norton & Company.

Dick, B. F. (2005). *Anatomy of film* (5th ed.). Boston, MA: Bedford/St. Martin's.

Ebert, R. (2004). Strangers on a train (1951) [Review of the motion picture *Strangers on a Train*] *Chicago Sun Times.* Retrieved from http://rogerebert.suntimes.com/apps/pbcs.dll/article?AID=/20040101/REVIEWS08/40802009/1023

Eco, U. (1976). *A theory of semiotics*. Bloomington, IN: Indiana University Press.

Eisenstein, S., & Vasilyev, D. (Directors). (1938). *Alexander Nevsky* [Motion picture].

　　Soviet Union: Mosfilm.

Eisenstein, S. (1977). *Film form: Essays in film theory* (J. Leyda, Ed. & Trans.). San

　　Diego, CA: Harcourt Inc. (Original work published 1949)

Eisenstein, S. M. (1975). *The film sense* (J. Leyda, Trans.). San Diego, CA: Harcourt

　　Brace & Company. (Original work published 1942)

Ekman, P., & Friesen, W. V. (1971). Constants across cultures in the face and emotion.

　　Journal of Personality and Social Psychology, *17*(2), 124-129.

Eysenck, S. B. G., Eysenck, H. J., & Barrett, P. (1985). A revised version of the

　　psychoticism scale. *Personality and Individual Differences*, *6*, 21-29.

Giannetti, L. D. (1975). The aesthetic of the mobile camera. In *Godard and others:*

　　Essays in film form (pp. 60-88). Cranbury, NJ: Fairleigh Dickinson University

　　Press.

Giannetti, L. (2011). *Understanding movies* (12th ed.). Boston, MA: Allyn & Bacon.

Gombrich, E. H. (1989). *Art and illusion: A study in the psychology of pictorial*

　　presentation. Princeton, NJ: Princeton University Press.

Hitchcock, A. (Director). (1951). *Strangers on a train* [Motion picture] United States:

　　Warner Bros. Pictures.

Holy Bible: New Testament (King James Version). (1993). Ashland, OH: Landoll.

John, O. P., Donahue, E. M., & Kentle, R. L. (1991). *The Big Five Inventory: Versions 4a*

　　and 54 (Tech. Rep.). Berkeley, CA: Institute of Personality and Social Research,

　　University of California, Berkeley.

Kracauer, S. (1960). *Theory of film: The redemption of physical reality.* Princeton, NJ:

　　Princeton University Press.

Kuleshov, L. (1974). *Kuleshov on film: Writings of Lev Kuleshov* (R. Levaco,

    Trans./Ed.). Berkeley, CA: University of California Press.

Lieberman, E. A., Neuendorf, K. A., Denny, J., Skalski, P. D., & Wang, J. (2009). The

    language of laughter: A quantitative/qualitative fusion examining television

    narrative and humor. *Journal of Broadcasting & Electronic Media*, *53*, 497-514.

Metz, C. (1974). *Film language: A semiotics of the cinema.* Chicago, IL: The University

    of Chicago Press.

Montfort, N., & Bogost, I. (2009). *Racing the beam: The Atari video computer system.*

    Cambridge, MA: MIT Press.

Nielsen, S.E., Smith, J.H., & Tosca, S.P. (2008). *Understanding video games: The*

    essential introduction. New York, NY: Routledge.

O'Leary, B. (2003). Hollywood camera movements and the films of Howard Hawks: A

    functional semiotic approach. *New Review of Film and Television Studies, 1*(1), 7-

    30.

Osgood, C. E., Suci, G. J., & Tannenbaum, P. H. (1957). *The measurement of meaning*.

    Urbana, IL: University of Illinois Press.

Palka, J. W. (2002). Left/right symbolism and the body in ancient Maya iconography and

    culture. *Latin American Antiquity*, *13*(4), 419-443.

Peters, J. M. (1981). *Pictorial signs and the language of film*. Amsterdam: Rodopi.

Phillips, W. H. (2005) *Film: An introduction* (3rd ed.). Boston, MA: Bedford/St. Martin's.

Salomon, G. (1979). *Interaction of media, cognition, and learning: An exploration of*

    how symbolic forms cultivate mental skills and affect knowledge acquisition. San

    Francisco, CA: Jossey-Bass Publishers.

Salt, B. (2005). A note on "Hollywood camera movements and the films of Howard

      Hawks: A functional semiotic approach" by Brian O'Leary. *New Review of Film*

      and Television Studies, 3(1), 101-103.

Salt, B. (2009). The shape of 1999: The stylistics of American movies at the end of the

      century. In W. Buckland (Ed.), *Film theory and contemporary Hollywood movies*

      (pp. 124-149). New York: Routledge.

Stam, R., Burgoyne, R., & Flitterman-Lewis, S. (1992). *New vocabularies in film*

      semiotics: Structuralism, post-structuralism and beyond. London: Routledge.

Tykwer, T. (Director/Writer). (1998). *Lola rennt* [Motion picture]. Germany: X-Filme

      Creative Pool.

Table 1. Orthogonal factor analysis of 17 evaluative measures.

The film clip was:	Comfort/ Safety 1	Negative Affect 2	Normalcy 3	Activity 4	"Id" 5	Superior 6	Commu -nalities
Comfortable/ Uncomfortable	**-.852**	.010	-.047	.089	-.135	.021	.755
Evil/Virtuous	**.722**	.061	.258	.077	-.021	.387	.748
Positive/Negative	**-.673**	.375	-.022	.144	.194	.063	.657
Dangerous/Safe	**.662**	.012	.190	.188	.310	-.035	.607
Didn't Like Clip/ Liked it a Lot	.291	**-.674**	.206	.273	-.019	.120	.671
Good/Bad	-.229	**.648**	.158	-.042	-.075	-.100	.515
Interesting/Boring	.396	**.626**	.064	-.276	.143	-.147	.671
Strong/Weak	.348	**.488**	.116	-.273	-.244	-.410	.675
Rare/Ordinary	-.013	.051	**.796**	-.181	.113	-.023	.683
Weird/Normal	.246	-.049	**.779**	.372	-.107	.004	.819
Emotional/Logical	.279	.320	**.563**	-.105	.137	.264	.597
Fast/Slow	-.055	.186	.089	**-.749**	-.099	.141	.636
Passive/Active	-.092	-.080	.045	**.679**	-.167	.194	.543
Subordinate/ Superordinate	.059	-.054	.043	-.108	**.875**	-.058	.789
Conscious/ Unconscious	.186	.508	.162	.098	**.543**	.209	.667
Inferior/Superior	.145	-.298	.108	-.005	.017	**.771**	.716
Natural/Unnatural	-.321	.244	-.385	.086	-.282	**.443**	.594
Eigenvalue	2.867	2.208	1.947	1.529	1.459	1.335	[11.345]
Percent of Total Variance	16.867%	12.990%	11.453%	8.996%	8.584%	7.853%	[66.74%]

NOTE: Except where noted, table entries are rotated factor loadings. Bolded figures are primary loadings.

Table 2. ANOVA test for Negative Affect factor scores.

Condition (Left/Right)	Mean	SD	N
Left to Right	-.253	.980	48
Right to Left	.230	.971	53
Total	.000	1.00	101

Source	df	Mean Square	F	Sig.
Main Effect:				
Condition (Left/Right)	1	5.877	6.181	.015
Error	99	.951		
Total	100			

Table 3. Two-way ANOVA test for Negative Affect factor scores.

Condition (Left/Right)	Psychoticism	Mean	SD	N
Left to Right	Low	-.431	.987	24
	High	-.076	.960	24
	Total	-.253	.980	48
Right to Left	Low	-.073	.725	21
	High	.428	1.07	32
	Total	.230	.970	53
Total	Low	-.264	.884	45
	High	.212	1.04	56
	Total	.000	1.00	101

Source	df	Mean Square	F	Sig.
Main Effects:				
Condition (Left/Right)	1	4.582	4.970	.028
Psychoticism	1	4.516	4.898	.029
Interaction Effect:				
Condition (Left/Right) X Psychoticism	1	.131	.142	.708
Error	97	.922		
Total	101			

Table 4. Crosstabulation of condition and perception of character movement.

			Condition (Left/Right)		Total
			Left to Right	Right to Left	
Respondent Perception of Character Movement	Left to Right	Count	**39**	8	47
		Row %	83.0%	17%	100.0%
		Column %	81.3%	15.1%	46.5%
	Right to Left	Count	9	**45**	54
		Row %	16.7%	83.3%	100.0%
		Column %	18.8%	84.9%	53.5%
Total		Count	48	53	101
		Row %	47.5%	52.5%	100.0%
		Column %	100.0%	100.0%	100.0%

Pearson Chi-Square = 44.308, df = 1, $p<.001$
NOTE: Bolded numbers indicate correct responses.

Table 5. Crosstabulation of condition and perception of camera movement.

			Condition (Left/Right)		Total
			Left to Right	Right to Left	
Respondent Perception of Camera Movement	Left to Right	Count	**39**	6	45
		Row %	86.7%	13.3%	100.0%
		Column %	81.3%	11.3%	44.6%
	Right to Left	Count	9	**47**	56
		Row %	16.1%	83.9%	100.0%
		Column %	18.8%	88.7%	55.4%
Total		Count	48	53	101
		Row %	47.5%	52.2%	100.0%
		Column %	100.0%	100.0%	100.0%

Pearson Chi-Square = 49.860, df = 1, $p<.001$
NOTE: Bolded numbers indicate correct responses.