The purpose of this chapter is to provide a detailed review of relevant literature in order to figure out the research gaps, formulate the hypotheses and develop the conceptual framework of the study. Primarily, this chapter is structured around three sub-sections. In the first sub-section, a review of studies that deal with information processing in advergames are provided. Specifically, it serves the purpose of identifying potential research gaps in the said literature, i.e., influence of motivation on information processing and implicit memory of advergame players. In the second sub-section, a review of regulatory focus theory, an underlying principle of motivation and its strategic implications are presented. In the final and third sub-section, a thorough review of research on implicit memory, how it works, and its importance in understanding communication effects are provided. At the end of the literature review, potential research gaps are identified.

2.1 Information Processing in Advergames

In the pursuit of examining how game players process brand related information (e.g., brand logos, brand names, product category) embedded in online advergames, Lee and Faber (2007) conducted a study that explored the role of attentional resources on game players’ processing and memory of brand names in a car racing advergame. By employing the perspective of the limited
capacity model of attention (Kahneman, 1973; Lang and Basil, 1998), the authors presumed that during game playing, total processing capacity of the players would be shared between the primary task (playing the game) and the secondary task (noticing, processing and remembering brand names). More the processing and attentional resources consumed by the primary task, less would be the amount of spare resources left to process the secondary task. If the brand messages received limited spare resources, the authors predicted that the location of the placement of the brand names in the game (proximity) and the thematic connection between the product category of the brand and the content of the game (congruity) would affect players’ memory for brand names and that these relationships would be moderated by players’ involvement level and game playing experience. Hence, a 2 (product placement proximity: focal vs. peripheral) x 2 (game involvement: high vs. moderate) x 2 (prior game playing experience: experienced vs. inexperienced) x 3 (game product congruity: high, moderate, low) mixed factorial design tested the study propositions with game-product congruity as the within-subject manipulation and involvement, experience and proximity as between-subject manipulations. A repeated measure MANCOVA (covariate: gender of players) on the data collected from 155 students of a Mid-Western University revealed that focal brands were better recalled than peripheral brands and that this difference in recall was more prominent for inexperienced players as compared to experienced players. In fact, focal brands were found to be always better recalled than peripheral brands except for experienced players in high involvement condition. Finally, it was revealed from the study that highly incongruent brands impacted brand memory more significantly as compared to highly congruent and moderately incongruent brands and that this impact of incongruity was most prominent for highly involved inexperienced players.
Gangadharbatla (2007) also compared the differential nature of information processing by game players under two different modes of consumption of game content, active and passive. Individuals who play the game in person are defined as active players and those who watch others playing the game are defined as passive players. Three theories of information processing, namely, active versus passive processing (Lachman et al., 1979), limited capacity model of mediated processing (Lang, 2000) and perceptual load theory (Lavie, 1995) were used to develop the conceptual framework which suggested differences in recall, attitude toward the brand and purchase intention between active and passive modes of consumption of game content. A 2 (mode of consumption: active vs. passive) x 2 (presence of stimulus: billboard present vs. billboard absent) between-subject design was employed in the study. A sample of 200 subjects participated in the experiment and played a car racing advergame specially designed for the study. Analysis using t-tests and two-way MANOVA was done which suggested that the passive players who only watched the advergame being played by others significantly recalled more brand names embedded in the advergame than active players who engaged most of their attentional and processing resources in playing. However, no differences in attitude toward the brand and purchase intention were found between active and passive modes of consumption.

Gangadharbatla (2008) investigated the influence of gender, arousal and presence on information processing in a car racing advergame. He also employed the limited capacity model of attention (Kahneman, 1973) as the theoretical framework to predict that female gamers would be less involved as compared to their male counterparts in playing the game. Hence, female players would possess more spare resources to be allocated to process secondary messages such as brand logos and brand names placed in billboards alongside the racing track in the game. Also, higher levels of arousal and presence would utilize more cognitive processing resources of the gamers
in processing the primary task, i.e., playing the game, which in turn would lead to insufficient amount of spare resources to process the secondary task, i.e., processing brand related information in the game. Hence, incomplete processing of brand information would lead to lesser amount of brand recall. A sample of 55 under-graduate students of a South-Western University was used in the study. As predicted, female gamers recalled significantly more brand names that male gamers. A linear regression analysis with overall recall scores as the dependent variable and gender, arousal and level of presence as predictors revealed that both arousal and presence negatively affected brand recall (negative beta coefficients).

In a similar study, Dardis et al. (2012) investigated the influence of level of experience obtained from playing an advergame on brand recall and attitude toward the brand. Limited capacity model of mediated message processing (Lang, 2000) was utilized in the study to predict that easier games, as compared to difficult games, would allow players to possess more spare cognitive resources to process brand messages in the advergame. It was also hypothesized that focally placed brands would lead to favorable experiences as these brands were more central to the game play. A sample of 85 under-graduate students of an American University played Forza II, a car racing game, under an easy and a difficult condition. The experiment comprised of a 2 (game playing condition: easy vs. difficult) x 2 (brand prominence: central vs. peripheral) between-subjects design. ANOVA results indicated that brands embedded in easier version of the game were better recalled than the difficult version. This effect became more prominent for central brands than peripheral brands. However, more spare cognitive resources to process brand messages did not lead to more favorable purchase intentions.

Hang and Auty (2008) examined the influence of brand exposure in advergames on information processing fluency of children which in turn further impacted brand recall and brand choice.
They considered the moderating role of mood of game players while playing the advergame on processing fluency. The authors hypothesized that when children were exposed to product placements in an advergame, an incidental exposure to the brands would lead to perceptual processing fluency later when they were again exposed to the same set of brands in a non-game playing situation. This subjective ease in processing the stimuli would be eventually misattributed to favourable brand choices instead of the true source of fluency. However, they also conceptualized that negative mood of children during game play would offset this hedonic marking of processing fluency leading to unfavorable brand choices. 165 Chinese children were subjected in two experiments in the study. A data analysis using ANOVA revealed that indeed children’s exposure to placements in the game resulted in more favorable brand choices as compared to those who did not get exposed to the placements. As predicted, it was also found that children in the positive mood condition were significantly more likely than children in other conditions to choose the brands they saw earlier while playing the game. Alternatively, children in the negative mood condition possessed more unfavorable attitude toward the brands which led to lesser brand choices. Overall impact of processing fluency on brand recall was found to be low, however.

In a similar study, Hang and Auty (2011) also examined the influence of interactivity and exposure to product placement on information processing fluency of children aged between 9 to 10 years. It was predicted that mere incidental exposure to visual stimuli of a brand (logo) without any interaction would trigger perceptual processing fluency among players when the brand was again exposed later in a non-game playing situation. Unaware of the true source of the fluency, consumers would misattribute the positive evaluative response elicited by the fluency as brand preference. Alternatively, interaction with the brand without exposure toward the visual
stimuli would lead to conceptual processing fluency which would again be misattributed causing heightened brand preference. The authors measured perceptual and conceptual fluency by means of players’ brand preference in stimulus-based and memory-based situations respectively. Hence, a 2 (produce placement exposure: exposed vs. not exposed) x 2 (processing fluency: memory-based choice vs. stimulus based choice) between-subject design was incorporated in the study. A sample of 205 children was first exposed to the game followed by collection of data on their recall rate and brand preferences. As predicted, the results revealed that when the children did not interact with the brand but only got exposed to it, perceptual fluency in information processing took place leading to positive brand preferences in a stimulus-based situation. On the other hand, when children interacted with the brand without getting exposed to it during game play, they got influenced by conceptual fluency. Finally, opportunity to interact with the brand and getting exposed to it led to synergistic effects enabling both perceptual and conceptual processing fluency to occur.

Cauberghe and Pelsmacker (2010) investigated the impact of product placement strength, measured in terms of brand prominence and game repetition, on game players’ recall and attitude toward the brand. The moderating influence of product category involvement was also examined in the study by predicting that players’ level of involvement with the product category would interact with brand prominence and game repetition which would eventually impact brand recall and brand attitude differentially. Using Berlyne’s (1970) two-factor model, a wear-in (learning) and wear-out (tedium) mechanism was predicted in order to understand players’ processing of brand names in the advergame under low and high level of game repetition conditions. The study design comprised of a 2 (brand prominence: prominence vs. subtle) x 2 (game repetition: high vs. low) x 2 (product category involvement: high vs. low) between-subjects design. Two
experiments were conducted in the study. In experiment 1 (n = 480), the game repetition was a force manipulated condition by the researchers while in experiment 2 (n = 88), the game repetition was left to the players’ choice which depended upon their liking of the game. An ANCOVA (covariates: attitude toward game, attitude toward advertising in general) on the data collected from both the experiments revealed a positive main effect of brand prominence on brand recall but no effect on brand attitude. Prominent placements were more integrated with the game and received better cognitive processing from the players than subtle placements which explained the difference in recall. On the other hand, the authors argued that given the pleasurable gaming experience, prominent placements did not generate more negative thoughts than subtle ones, and as a consequence, affect transfer happened equally well for both types of placement. The results also revealed that repeated game playing had no effect on brand recall (due to faster wear-in) but had a negative effect on brand attitude (due to faster wear-out). Product category involvement interacted only with game repetition resulting in more negative attitude for high involvement product as compared to low-involvement product.

With similar research intent of how violent cues are perceived and processed by gamers, Yoo and Pena (2011) investigated the effect of presence or absence of violent cues on players’ recall and recognition memory of embedded brands, brand attitude and purchase intention. They conceptualized the framework with the help of limited capacity model of attention (Kahneman, 1973; Lang, 2000) and cognitive priming theory (Tulving and Schacter, 1990) and predicted that violent cues would divert players’ attention away from embedded ads and processing of violent cues would take up more cognitive resources which in turn would negatively impact brand memory. Also, it was hypothesized that violent cues would prime players negatively resulting in less favourable brand attitude and purchase intention. A sample of 68 under-graduate students of
a Mid-Western University was selected for the study. Half of the sample (n = 34) played a violent version of a custom built game while the other half played the non-violent version of the same game. Levels of interactivity and cognitive load of gamers were kept constant across manipulated conditions. Data analysis using ANCOVA (covariate: gamers’ experience) revealed that indeed violent cues impaired advertising effectiveness with reduced levels of brand recall, recognition and less favourable attitude toward embedded brands.

In a study conducted by Huang and Yang (2012), the authors investigated the effect of relevance between product category and theme of the game on players’ brand memory and attitude toward the placement. This study also explored how brand message presented via animated and static billboards were processed differently by game players. The limited capacity model of mediated message processing (Lang, 2000) was employed to explain the effects of ad type (animated or static) on information processing by gamers while the assimilation and contrast theory (Meyers-Levy and Tybout, 1997) explained the impact of game-ad relevance. The experiment comprised of a 2 (ad type: static billboards vs. animated billboards) x 2 (game/ad relevance: high vs. low) between-subjects design. The sample (n = 122) comprised of a randomly selected pool of online gamers of Taiwan. The game selected for the study was a football game named as Frekick Football. The high relevance situation embedded a sports drink brand while the low relevance situation embedded a coffee brand. An ANOVA was run on the data which revealed significant main effects of ad type on brand recognition and attitude toward placement. It was concluded that animated billboards forced players to allocate more cognitive resources through automatic resource allocation procedure, known as orienting response mechanism, and were encoded in short term memory more thoroughly as compared to static billboards. Also, animated ads were more vividly presented to players’ visual senses which resulted in more favorable attitudes. The
results also revealed a significant main effect of game-ad relevance on brand recall and attitude toward placement. Irrelevant or incongruent ads were perceived as novel, distinctive and prominent and generated contrast effects. This in turns led to more cognitive elaboration by gamers in order to resolve the incongruity which resulted in better brand recall as compared to congruent ads which were assimilated with pre-existing mental schema without much effort. However, congruent ads generated more favorable attitudes than incongruent ones because they matched players’ expectations and were well integrated with existing schema. The authors concluded that depending on the marketing objective, the advertisers should customize the congruency of ads embedded in advergames.

In an altogether different study from the existing genre, Lai and Huang (2011) explored how brand and product information were processed and learnt by gamers. More specifically, they investigated information processing by gamers based upon three learning approaches, namely, classical conditioning, operant conditioning and cognitive learning, in three different advergames. The dependent measures were brand recall, product attribute information recall, attitude toward game and purchase intention. They predicted that advergames that were developed based upon cognitive learning approaches were more involving and required more cognitive processing and mental elaboration of brand and product attribute information which would result in better brand recall as compared to advergames built upon conditioning approaches. However, cognitive learning would require more time and effort in processing the stimuli which would neutralize the effect on brand attitude formation. Alternatively, it was hypothesized that information presented in classical and operant conditioning based advergames would be processed more peripherally and hence result in more positive attitude. Three advergames were developed which embedded the same brand, a Zebra Energizing Pen with a
brand proposition that it reduced the fatigue of writing. The differences between the games were that each of the games incorporated one of the three learning approaches as mentioned above. A sample of 209 Taiwanese subjects was selected for the study. Data analysis using MANOVA and linear regression analysis revealed a significant main effect of learning approach on brand recall and attitude toward the game. As predicted, it was found that cognitive learning based advergame influenced brand recall the most and attitude toward the game the least. On the other hand, classical conditioning based advergame led to least recall rate but the highest attitude formation. Finally, it was found that attitude toward the game had a significant positive impact on purchase intention.

Two things are clearly evident from this extant literature on information processing in advergames. First, while the effects of playing advergames and various product placement dimensions have been established, the role of game outcomes and outcome-induced motivation on information processing has been totally neglected. While it may be presumed that just like any other gaming contexts, computer games engender wins and losses as two distinct states of situational outcomes, the impact of these outcomes on game players’ emotions and subsequently on their motivation and capacity to process brand related information embedded in advergames remain unexplained. It may also be noted here that outcomes are nevertheless important to consider because they have been shown to influence mood (Hirt et al., 1992), an important predictor of ad evaluation.

Secondly, all these studies investigate the impact of playing advergames on players’ explicit memory (recall and recognition). This measurement bias is a by-product of the dominant assumption that learning requires attention, effort, and concentration. In other words, only cues available to consciousness should impact behavior. The conclusion then for placement
researchers is that to be effective a placement ought to be consciously recalled. However, informational cues and brand stimuli might also have an impact on consumers’ unconscious memory, also popularly known as implicit memory (Jacoby, 1983; Roediger, 1990; Weldon and Roediger, 1987). Likewise, consumers’ behavior and purchase decisions might also be influenced by unconscious or implicit memory processes, specifically at the time of purchase in stimulus-based situations (Duke and Carlson, 1993; Holden and Vanhuele, 1999; Lee, 2002). Further, impact on implicit memory is most salient when consumers’ attention is divided between primary and secondary activities (Shapiro and Krishnan, 2001). Advergames, where players’ attention is divided between playing the game and processing brand related information, provide a perfect opportunity to test players’ implicit memory for brands placed in the games. However, none of studies mentioned above take into consideration impact of in-game placement on players’ implicit memory.

The following sections present a theoretical background on regulatory focus as an underlying principle of motivation followed by research on implicit memory processes which is later required for hypotheses formulation and development of the conceptual framework.

2.2 Regulatory Focus

2.2.1 Regulatory Focus Theory as a Motivational Principle

The most significant motivational principle that has received extensive attention from academicians and practitioners till date is the hedonic principle which asserts that people are motivated to approach pleasure and avoid pain (Crowe and Higgins, 1997; Higgins, 1997). This principle has influenced scholarly work of motivation across all areas of psychology, including
theories of psychobiology, decision making in cognitive and organizational psychology, conditioning in human learning, social psychology, and performance related motivation.

However, to understand the true nature of approach-avoidance motivation and to understand how one can approach pleasure and avoid pain, psychologists have come up with the *Regulatory Focus* principle of motivation. In this regard, Higgins (1997) states that “…the problem with the hedonic principle is not that it is wrong but that psychologists have relied on it too heavily as an explanation for motivation. After many centuries, it continues to be the dominant way to conceptualize approach versus avoidance. This dominance has taken attention away from other approach-avoidance principles (p.1).”

In fact, the development of regulatory focus theory is mostly attributed to E. Tory Higgins. Higgins (1997, p.1) further states that it is high time to move beyond the simple assertion of the hedonic principle that people approach pleasure and avoid pain and investigate other self-regulatory principles that underlie this hedonic principle. More specifically, if it is already known that people are motivated to approach pleasure and avoid pain, it is more important to examine how people approach pleasure and avoid pain in substantially different ways that have major strategic consequences. He further claims that understanding of these processes would also add significant value in the existing body of knowledge in the domain of motivational principles.

### 2.2.2 Development of Regulatory Focus Theory and its Strategic Implications

In order to explain how people approach pleasure and avoid pain, i.e., approach desired and avoid undesired end states respectively in different strategic ways, the conceptual fabric of the regulatory focus theory that explains these strategically different processes is derived from the
self-discrepancy theory, an earlier work done by Higgins and his colleagues (Higgins et al., 1985, 1986; Strauman and Higgins, 1987).

Specifically, Higgins (1987) presents the self-discrepancy theory based upon prior empirical studies. This theory conceptualized by Higgins (1987) distinguishes between two types of desired end states – (a) an ideal desired end state, which are individuals’ representations of someone’s (self or significant other) aspirations, hopes and wishes for them, and (b) an ought desired end state, which are individuals’ representations of someone’s (self or significant other) obligations, duties and responsibilities for them. It is further suggested that the self-discrepancies between the actual self state and any of these two desired end states (i.e., the actual-ideal discrepancy and the actual-ought discrepancy) are associated with negative psychological situations which further leads to emotional discomforts/problems. However, it is also stated that these self-discrepancies between the actual self and the ideal or ought self guides function as motivational cues and the individual becomes motivated to self-regulate himself or herself in order to reduce these discrepancies. According to the self-discrepancy theory, actual-ideal self-discrepancy leads to absence of positive outcomes whereas self-congruency to aspirations hopes and wishes results in presence of positive outcomes. Thus, the psychological situations involved in ideal self-regulation are absence and presence of positive outcomes. Further, an actual-ideal self-discrepancy generates dejection-related emotional problems, e.g., dissatisfaction, disappointment, sad and gloomy. Conversely, the actual-ought self-discrepancy leads to presence of negative outcomes whereas self-congruency to obligations, duties and responsibilities results

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1 These studies were conducted by Higgins and his colleagues during the mid 1980s. Few of these empirical studies are published and few remain unpublished till date. Hence, the crux of the self-discrepancy theory is mentioned here that underlies the development and theoretical propositions of the regulatory focus theory.

2 These desired end states are also referred to as self guides whereas the actual self state is more popularly referred as self-concept in the psychology literature.
in absence of negative outcomes. Thus, the psychological situations involved in ought self-regulation are presence and absence of negative outcomes. Further, an actual-ought discrepancy generates agitation-related emotional problems, e.g., fear, guilt, feeling threatened and anxiousness. Finally, based upon the prior empirical studies, Higgins suggests that the magnitude, accessibility and type of self-discrepancy (actual-ideal or actual-ought) influences the amount and type of emotional-discomfort that will be generated (dejection- or agitation-related).

Table 1: Summary of Regulatory Forms as a Function of Valence of End States as a Reference Point and Direction of Means

<table>
<thead>
<tr>
<th>Direction of stated means</th>
<th>Valence of end states as reference point</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Desired (discrepancy reducing)</td>
</tr>
<tr>
<td>Approach</td>
<td>Approaching matches to desired end states</td>
</tr>
<tr>
<td>Avoidance</td>
<td>Avoiding mismatches to desired end states</td>
</tr>
</tbody>
</table>

Higgins et al. (1994) investigated whether individuals’ predilections to different forms of self-regulation differed for regulation in relation to their ideal self guides (i.e., hopes, wishes, aspirations) versus their ought self-gudies. Based upon two basic distinctions regarding self-regulation, valence of end states (desired vs. undesired) and direction of stated means (approach vs. avoidance), the authors first identified four distinct self-regulatory forms. Table 1 summarizes these four forms or strategic means of self-regulation. Based upon self-discrepancy

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3 This distinction is also similar to the distinction as: Positive vs. Negative.
theory it was hypothesized that while ideal self-regulation would involve a predilection to approach matches between actual self-state and desired end states, ought self-regulation would involve a predilection to avoid mismatches between actual self-state and desired end states. Conversely, based upon Carver and Scheier’s (1990) self-regulatory model, it was also hypothesized that while ideal self-regulation would involve a concern with positive outcomes and would try to reduce discrepancies between actual self-state and desired end states (i.e., a predilection to approach matches and avoid mismatches between actual self-state and desired end states), ought self-regulation would involve a concern with negative outcomes and would try to amplify discrepancies between actual self-state and undesired end states (i.e., a predilection to approach mismatches and avoid matches between actual self-states and undesired end states).

These alternate possibilities of ideal versus ought predilections were tested in three independent studies. In Study 1, a sample of 44 under-graduate students of Columbia University was selected who filled up a selves questionnaire that asked respondents to list attributes about their actual self, ideal self and ought self either from their own standpoint or from the standpoint of some significant others (mother or father). For each subject, experimenters then selected two distinct ideal self attributes that did not overlap with any ought self attributes and two distinct ought self attributes that did not overlap with any ideal self attributes. Subjects reappeared few weeks later to do an unrelated task which originally measured subjects’ predilections for approach or avoidance by enabling them to judge whether a statement “what really matters to me is to try…. (use a particular regulatory form)” as like them or unlike them. Each regulatory form as mentioned in Table 1 appeared four times, twice instantiated by two ideal self attributes and twice instantiated by two ought self attributes that were selected earlier by the experimenters. Thus the manipulation of ideal and ought self-regulation was done. A 2 (type of self-guide
activated: ideal vs. ought) x 2 (valence of end states: desired vs. undesired) x 2 (direction of stated means: approach vs. avoidance) x 2 (statement order: 1, 2, 3, 4) experimental design tested the hypothesized relationships. The first three variables were within-subject variables while the fourth one was a between-subject variable. A significant Type of Self Guide Activated x Valence interaction was found which supported Carver and Scheier’s (1990) findings that ideal self-regulation with its positive outcome focus, would be associated with its self-regulatory forms involving approach (i.e., discrepancy reducing), while ought self-regulation with its negative outcome focus, would be associated with self-regulatory forms involving avoidance (discrepancy amplifying). A significant three-way interaction was also found between Type of Self-Guide Activated x Valence x Direction which supported part of propositions of self-discrepancy theory. More specifically, subjects judged statement expressing the importance of approaching matches to desired end states to be more like them when ideal self-guides were activated than when ought self-guides were activated. However, no significant difference in how subjects judge statements expressing the importance of avoiding mismatches to desired end states as a function of type of self-guide activated was found.

In Study 2, the same experimental design was applied; the only difference being type of self-guide activation was now a between-subject manipulation. 37 subjects, all under-graduates student of Columbia University, were randomly distributed to either an ideal self-guide activation condition in which they thought and wrote about their hopes and wishes and how these had changed over time, or an ought self-guide activation condition in which they thought and wrote about their duties and responsibilities and how these had changed over time. After this exercise, all subjects read various episodes\(^4\) that happened over four days in the life of another

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\(^4\) There are 16 such episodes; 4 regulatory forms x 4 distinct ideal and ought self attributes.
student. These episodes exemplified each of the regulatory forms as mentioned in Table 1. Finally, predilections to approach or avoidance means was tested in a free recall task with the assumption that high predilection for a particular regulatory form would be reflected in terms of better recall of episodes exemplifying that form. As hypothesized, a significant Type of Self-Guide Activated x Direction was revealed which suggested an overall tendency to better recall episodes highlighting approach when ideal versus ought self-regulation was activated and vice-versa leads to better recall of episodes highlighting avoidance. Also, planned contrast t-tests revealed that subjects recalled episodes exemplifying approaching matches to desired end states when ideal versus ought self-guides were activated whereas the vice-versa led to better recall of episodes exemplifying avoiding mismatches to desired end states.

Lastly, in Study 3, it was revealed that subjects with predominant (chronic) ideal self-regulation versus predominant (chronic) ought self-regulation selected different tactics when asked about their strategies for friendship. While the former selected strategies involving approaching matches to desired end states (e.g., be supportive to friends; be emotionally supportive) the latter selected strategies involving mismatches to desired end states (e.g., stay in touch; don’t lose contact with friends). Hence, this study by Higgins et al. (1994) empirically validated that ideal self-regulation with concerns about presence and absence of positive outcomes engendered a strategic inclination to approach matches to hopes and aspirations, whereas ought self-regulation with concerns about absence and presence of negative outcomes engendered a strategic inclination to avoid mismatches to duties and regulations. It was further validated that these
predilections were visible both at the general level (approach pleasure and avoid pain) as well as at the systems level (distinct approach and avoid strategies for pleasure and pain).

Higgins (1996a) conceptualized ideal and ought self-regulation as being two distinct types of regulatory focus. Ideal self-regulation is considered to have a promotion focus while ought self-regulation is considered to have a prevention focus. The author suggested that regulatory focus or types of self-regulation is a chronic individual differences variable which gets incorporated within individuals by means of socialization process. It is further asserted that different types of caretaker-child interactions influence different kinds of psychological situations experienced by children that eventually underlie distinct regulatory focus (promotion or prevention) and self-guide acquisition. The child experiences the presence of positive outcomes when caretakers, for example, encourage the child to overcome difficulties or set up opportunities for the child to engage in rewarding activities, and the child experiences the absence of positive outcomes when caretakers, for example, take away a toy when the child refuses to share it or stop a story when the child is not paying attention. The caretaker’s message to the child in both cases is that what matters is attaining accomplishments or fulfilling hopes and aspirations, but it is communicated in reference to either a desired or an undesired state of the child—either “This is what I would ideally like you to do” or “This is not what I would ideally like you to do”. The regulatory focus is one of promotion, i.e., a concern with advancement, growth, accomplishment. In contrast, the child experiences the absence of negative outcomes when caretakers, for example, train the child to be alert to potential dangers or teach the child to “mind your manners,” and the child

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5 Here, pleasure and pain is synonymous to positive and negative valence or with desired and undesired end states.

6 Caretaker predominantly means parents. However, the author argues that the term “caretaker” could also include teachers, babysitters, siblings and camp counselors.
experiences the presence of negative outcomes when caretakers, for example, yell at the child when he or she does not listen or criticize the child when he or she makes a mistake. The caretaker’s message to the child in both cases is that what matters is insuring safety, being responsible, and meeting obligations, but it is communicated in reference to either a desired or an undesired state of the child – either “This is what I believe you ought to do” or “This is not what I believe you ought to do.” The regulatory focus is one of prevention, i.e., a concern with protection, safety, responsibility.

Hence, distinct self-guide regulation (ideal or ought self-regulation) and regulatory focus is imbibed in individuals since childhood by ways of child-caretaker interactions and associated socialization processes. Bolstering and love-withdrawal received by children due to approaching or not approaching desired end states help acquire a promotion focus. In contrast, prudent and punitive modes of caretakers toward their children for avoiding and not avoiding mismatches to desired end states help them acquire a prevention focus.

More importantly, regulatory focus is not limited to being only chronic individual difference variable but situational factors also have the capability of inducing either a promotion focus or a prevention focus within individuals. This probability was tested in a study conducted by Roney et al. (1995). The objective of the study was to examine whether situational factors like task contingency (or goal framing) and performance feedback could incorporate either promotion or prevention focus within subjects which in turn might impact their motivation and emotion. It was presumed that framing goals or task contingencies with a positive outcome focus would induce a promotion focus where the concern was all about presence and absence of positive outcomes for reaching and not reaching the goals respectively. Similarly, performance feedback with a positive focus would also incorporate promotion focus within individuals. In contrast, framing
goals and providing performance feedback with a negative outcome focus would induce a prevention focus within individuals where the concern was all about absence and presence of negative outcomes for avoiding missing and missing the goals respectively. Induced promotion and prevention focus would further impact motivation and emotion. It was hypothesized that promotion focused individuals would exhibit better performance and higher persistence in their activities than prevention focused individuals. Also, they would exhibit dejection-related emotions if the goals were not met. On the other hand, prevention focused individuals would exhibit poorer performance and lower persistence in their activities than promotion focused individuals followed by agitation-related emotions if the goals were not met. Two studies were conducted to test these study propositions.

In Study 1, a sample of 42 under-graduate students of Columbia University was told that they would perform two tasks. For everyone the first task was an anagram solving task which included both solvable and unsolvable anagrams. All participants were informed that the second task could either be an interesting (desired) game playing task or a boring (undesired) word reading task. Promotion or prevention focus was induced by the first situational factor, task contingency, as mentioned above. Subjects in the promotion focus condition were told that if they solved 22 or more anagrams, they would get to do the desired task; otherwise they would do the undesired task. Subjects in the prevention focus condition were told that if they got 4 or more anagrams wrong, they would get the undesired task; otherwise they would get the desired task. Both dejection-related and agitation-related emotions were measured for all subjects in both the conditions before the beginning of anagram solving task, during solving and at the end of the anagram solving task. Also, time spent by participants to solve each anagram was measured. A 2 (emotion: dejection vs. agitation) x 3 (measurement period: pre-task, during task, post-task) x 2
(task contingency: positive outcome focus vs. negative outcome focus) mixed design ANOVA was used on mean ratings of dejection- and agitation-related emotions. Emotion and measurement period were within-subject variables whereas task contingency was a between subject variable. Results revealed that as subjects progressed toward solving the anagrams (i.e., achieving the goal) their agitation-related emotions decreased more in the prevention focus (i.e., negative outcome focus) condition than in the promotion focus (i.e., positive outcome focus) condition while their dejection-related emotions decreased more in the promotion focus condition than in the prevention focus condition. Further, by conducting a 3 (position of unsolvable anagrams: early, middle, late) x 2 (task contingency: positive outcome focus vs. negative outcome focus) ANOVA on time spent by subjects on unsolvable anagrams, it was revealed that promotion focused subjects were more persistent in their activities and spent significantly more time trying to solve unsolvable anagrams as compared to prevention focused subjects.

In Study 2, a sample of 59 under-graduate students of Columbia University was given a set of anagrams that contained both solvable and unsolvable anagrams. Each participant was given 45 seconds to solve each anagram but they were allowed to quit before the time ran out. Promotion or prevention focus was induced by the second situational factor, performance feedback, as mentioned above. Subjects in the promotion focus condition were given positive focus feedback, such as “Right, you got that one” (presence of positive outcome) when they were able to solve an anagram and “You did not get that one right” (absence of positive outcome) when they were not able to solve the anagram. In contrast, subjects in the prevention focus condition were given negative focus feedback, such as “No, you missed that one” (presence of negative outcome) when they were not able to solve an anagram and “You did not miss that one” (absence of
negative outcome) when they were able to solve the anagram. After this first trial, the subjects were given another set of anagrams to be solved, this time without any feedback. It was assumed that the performance feedback given to subjects after each anagram in the first trial had induced either promotion or a prevention focus in them. Both dejection-related and agitation-related emotions were again measured for all subjects in both the conditions before the beginning and at the end of the first trial. A 2 (emotion: dejection vs. agitation) x 2 (measurement period: pre-task vs. post-task) x 2 (performance feedback: positive focus vs. negative focus) mixed design ANOVA was used on mean ratings of dejection- and agitation-related emotions. Emotion and measurement period were within-subject variables whereas performance feedback was a between-subject variable. Results revealed that subjects’ dejection-related emotions increased more in the promotion focus (i.e., positive focus feedback) condition whereas their agitation-related emotions increased more in the prevention focus (i.e., negative focus feedback) condition. Further, by conducting a 2 (performance feedback: positive focus vs. negative focus) x 2 (trial of anagrams: during feedback vs. after feedback) ANOVA it was revealed that promotion focused subjects solved more anagrams that prevention focused subjects. Finally, it was revealed that promotion focused subjects were less likely to quit and hence were more persistent in trying to solve unsolvable anagrams as compared to prevention focused subjects.

Crowe and Higgins (1997) further compared performances of promotion focused and prevention focused individuals in difficult problem solving situations. They also compared differences in their strategic inclinations during decision making and generating alternatives. It was hypothesized that since promotion focused individuals approached matches to desired end states and were concerned about presence and absence of positive outcomes, they would be more motivated and would exhibit more persistence and better performance in difficult problem
solving tasks. They would be in a state of *eagerness* to attain advancement and gains while performing and would want to increase “hits” and avoid errors of omission (i.e., a loss of accomplishments). Hence, promotion focused individuals would also generate more alternatives and unique criteria while making decisions. In contrast, for prevention focused individuals, it was hypothesized that they would be less motivated and would exhibit less persistence and lower performance. They would be in a state of *vigilance* to assure safety and non-loss and would want to increase “correct rejections” and avoid errors of commission (i.e., making a mistake). Two studies were conducted to test these study propositions.

In Study 1, a sample of 138 Columbia University under-graduate students was employed. Two months before the main experiment, the students filled up a task rating questionnaire that asked them to rate how much they liked to do each of the 16 tasks on a 7-point Likert scale. This was required to set task contingency conditions (one liked and one disliked task was selected) for each subject in an idiosyncratic manner later during main experiment. The students also rated a “selves” questionnaire aimed at measuring each subjects’ chronic regulatory focus which was controlled during main experiment. When subjects appeared for the main experiment, they were told that they would perform two set of activities. For everyone the first set of activities involved five different problem solving tasks. All participants were informed that the second activity could either be their most liked (desired) task or their most disliked (undesired) task they had mentioned in their task rating questionnaire. Promotion or prevention focus was induced by task

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7 That promotion focused individuals will seek to increase hits and insure against errors of omission while prevention focused individuals will seek to increase correct rejections and insure against errors of commission, have been hypothesized in synchronization with signal detection theory (Tanner and Swets, 1954).

8 These tasks are namely, anagram solving, finding embedded figures, counting backward task, character listing task, and sorting task. The last two tasks are decision making tasks and seek to examine subjects’ strategic inclinations in each of the two regulatory focus conditions.
contingency manipulations⁹. 138 students were randomly assigned in each of these four manipulated conditions and a non-contingent (control group) condition followed by the commencement of the main experiment (problem solving tasks). Emotions of subjects were also assessed thrice – before start of experiment, during halfway of experiment and at the end of experiment. Data analysis using ANOVA on performance on each of the five tasks supported all predictions. It was revealed that promotion focused individuals exhibited better performance (e.g., more anagrams solved, more numbers generated in counting backwards task) and more persistence (e.g., less quitting tendency in embedded figures task) as compared to prevention focused individuals. They also were found to generate more alternatives and unique criteria during decision making (e.g., more attributes listed in character listing task) than prevention focused individuals. Finally, no significant impact of regulatory focus on emotion was found as because the regulatory focus was employed via task contingency and not through performance feedback mechanism.

Study 2 used a signal detection task to test more directly the hypothesized differences in strategic inclinations and response biases between promotion and prevention focused individuals. A sample of 65 Columbia University under-graduate students was employed in this study. The procedures, including contingency conditions, remained exactly the same as that of Study 1. The only difference was in the main experimental task that subjects did. The subjects saw a list of

⁹ Promotion (Presence of Positive): “If you do well on the exercises I’m about to give you, you will get to do the [participant’s desired task] instead of the other task.” Promotion (Absence of Positive): “If you do not do well on the exercises I’m about to give you, you won’t get to do the [participant’s desired task] but will do the other task instead.” Prevention (Absence of Negative): “As long as you don’t do poorly on the exercises I’m about to give you, you won’t have to do the [participant’s undesired task] but will do the other task instead.” Prevention (Presence of Negative): “If you do poorly on the exercises I’m about to give you, you will have to do the [participant’s undesired task] instead of the other task.”
nonsense (meaningless) words in the computer screen; completed a masking task, and then completed a recognition task. It was hypothesized that since promotion focused individuals were more eager to increase hits (successfully recognizing a true target, i.e., an earlier seen word) and sought to insure against errors of omission (omitting a true target), they should try to recognize as many items as possible in the recognition task. This would lead them to an inclination to say “yes” even for words not seen earlier (i.e., new words) and would thus engage in a “risky” response bias. In contrast, since prevention focused individuals were more vigilant to increase correct rejections (successfully avoiding a false detractor, i.e., a new word) and insure against errors of commission (failing to avoid a false detractor), they should try not to commit mistakes. This would lead them to an inclination to say “no” even for pre-exposed words (i.e., old words) and would thus engage in a “conservative” response bias. Data analysis using ANOVA on response bias\(^10\) revealed that indeed promotion focused subjects exhibited a risky response bias while the prevention focused subjects exhibited a conservative response bias\(^11\). It was also revealed that prevention focused subjects took more time to recognize a word than promotion focused subjects.

These distinctions are important to be considered because they suggest that a particular type of regulatory focus may be actuated momentarily within subjects through positively and negatively framed feedback about their performance in a task given to them. An advergaming context engenders wins and losses as two distinct states of situational outcomes. Hence, a key question

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\(^{10}\) Response bias, \(\beta = f(H)/f(FA)\), where \(f\) is probability density, \(H = \) Proportion of Hits; \(FA = \) Proportion of False Alarms

\(\beta = 1: \) No bias; \(\beta > 1: \) Bias toward No (conservative bias); \(\beta < 1: \) Bias toward Yes (risky bias)

\(^{11}\) Promotion Focus: \(M(\beta) = 0.92\); Prevention Focus: \(M(\beta) = 1.13\); \(F(1, 60) = 6.9, p = 0.01\)
this research addresses is whether winning or losing an advergame followed by positively or negatively framed feedback given to game players induce promotion focus or prevention focus in them. Understanding these distinctions, the nature of behaviour and strategic inclinations of two regulatory foci will help conceptualize a relationship between game outcomes and outcome-induced motivation. Furthermore, since this research attempts to explore the influence of game players’ regulatory focus on their implicit brand memory and brand attitude, knowledge about distinct self-regulatory systems and their strategic dispositions will aid in conceptualising these effects.

2.3 Implicit Memory

2.3.1 What is Implicit Memory?

One of the earliest works on learning and human memory is attributed to Hermann Ebbinghaus (1885/1964) who distinguishes between three cases of memory retrieval. In cases of voluntary recollection, “we can call back into consciousness by an exertion of the will directed to this purpose” these seemingly lost states of previous experiences (Ebbinghaus, 1885/1964, p.1). In a second case of involuntary recollection, “mental states once present in consciousness return to it with apparent spontaneity and without any act of the will; that is, they are reproduced involuntarily…..in the majority of cases we at once recognize the returned mental state as one that has already been experienced; that is, we remember it” (Ebbinghaus, 1885/1964, p.1). The first and second case of memory retrieval are more popularly known as aided and unaided recall in today’s date and constitute measures of explicit memory.

Finally, according to Ebbinghaus (1885/1964), there is a third and large group of case where “the vanished mental states give indubitable proof of their continuing existence even if they
themselves do not return to consciousness at all” (p.1). Thus prior learning, knowledge, or experience is reflected in present thought or behavior but without any trace of conscious reflection. “Most of these experiences remain concealed from consciousness and yet produce an effect which is significant and which authenticates their previous experience” (p.2). This third group reflects unconscious recollection of memory and is popularly defined as implicit memory.

Further, the essence of implicit memory and its effect on human behavior is simplistically explained by Ebbinghaus. He states that “mental states of every kind, sensations, feelings, ideas, which were at one time present in consciousness and then have disappeared from it, have not with their disappearance absolutely ceased to exist. Although the inwardly-turned look may no longer be able to find them, nevertheless they have not been utterly destroyed and annulled, but in a certain manner they continue to exist, stored up, so to speak, in the memory. We cannot, of course, directly observe their present existence, but it is revealed by the effects which come to our knowledge with a certainty like that with which we infer the existence of the stars below the horizon” (Ebbinghaus 1885/1964, p.1).

Much later in late 1970s and early 1980s, the interest in implicit memory or unconscious recollection resurfaced among memory researchers due to some striking evidences of unconscious memory retrieval by amnesic patients, i.e., patients suffering from memory loss. Consequently, significant number of studies has been conducted on implicit memory since then that suggest fundamental differences between explicit and implicit memory. Implicit memory is revealed “when previous experiences facilitate performance on a task that does not require conscious or intentional recollection of those experiences; explicit memory is revealed when performance on a task requires conscious recollection of previous experiences” (Schacter, 1987, p.501).
Tulving and Schacter (1990) further explain the functions of implicit memory, which is equivalent to that of priming, and is conceptualized as “to improve identification of perceptual objects. Priming is a type of implicit memory; it does not involve explicit or conscious recollection of any previous experiences” (p.501). Thus, explicit memory refers to conscious and intentional recollection or retrieval of previous stored information or experiences, and is assessed by traditional tests of recognition and recall. By contrast, implicit memory refers to changes in task performance or observed behavior produced by priming effects of prior experiences without the conscious or intentional retrieval of those experiences (Schacter, 1992).

2.3.2 Dissociation between Implicit and Explicit Memory

The striking feature of implicit memory that differentiates itself from explicit memory is that implicit memory reflects unaware or unconscious expressions of retention and memory retrieval. This unconscious retrieval further impacts individuals’ behaviour and task performance. Memory researchers have empirically investigated this unconscious nature of implicit memory by exploring dissociations between explicit and implicit memory in numerous studies (Blaxton, 1989; Jacoby, 1983; Srinivas and Roediger, 1990).

One of the earliest studies concerning dissociation between explicit and implicit memory among amnesic patients was conducted by Warrington and Weiskrantz (1970). Amnesic patients are referred here as those who suffer from some form of brain injury which renders them incapable of retaining new experiences while leaving other cognitive functions of the brain intact (Roediger, 1990). In their study, Warrington and Weiskrantz compared amnesic patients’ performance on explicit and implicit tests of memory with those of control subjects’ performance. In the two experiments that were conducted, they presented lists of English words
to be read aloud to 4 amnesic patients and 14 control subjects. Following this learning condition, comparison of retention was done between amnesic patients’ and control subjects’ performance on four types of memory tests. Two of the tests were classified as involving explicit retention (recognition and free recall) and the other two as involving implicit retention (letter stem completion and naming fragmented words). A between-subject ANOVA was conducted on memory retention scores which revealed that control subjects outperformed amnesic patients significantly in explicit memory tests. However, a comparison of retention scores on implicit memory tests revealed that amnesic patients performed at par as compared to control subjects. The findings thus validated two important things – first, amnesic patients could retain information in long term memory which could be retrieved more unconsciously by means of implicit memory tests and second, a clear-cut dissociation existed between implicit and explicit memory among amnesic patients.

If explicit and implicit measures of memory produce dissociations only in patients suffering from amnesic syndrome, then the phenomena would have been of least interest. However, this is not the case; analogous dissociations have been repeatedly observed in researches involving normal subjects. Larry Jacoby demonstrates dissociation between implicit and explicit memory in numerous studies (Jacoby, 1983, 1988; Jacoby and Dallas, 1981; Jacoby and Witherspoon, 1982).

In one of his studies, Jacoby (1983) investigated the impact of nature of processing during learning a stimulus on memory of the same during a later episode. He manipulated the conditions in which the subjects learnt words prior to completing one of the two tests of memory – implicit or explicit. The explicit memory test comprised of a test on recognition memory while implicit memory was measured in a perceptual identification test which reflected subjective ease of
reading words earlier exposed to subjects during learning. This exemplified an unconscious retrieval of memory because the subjects were only asked to read aloud words briefly shown to them in the perceptual identification test without any instruction of conscious memory retrieval. It was assumed that the subjective ease in reading an earlier learnt word, if any, as compared to a new word (i.e., foils) was due to an unaware recollection of memory of that particular word. Further, he presumed that recognition memory test relied on conceptual-driven processing while a perceptual identification test relied on data- or visual-driven processing. Jacoby conducted four experiments in which he manipulated learning conditions which involved whether or not subjects read aloud words out of context (xxx-COLD), read aloud the words in a meaningful context (hot – COLD) or generated them from the context (hot - ????. Target words were antonym pairs of context words in all cases. The learning condition was a within-subject manipulation, i.e., all subjects learnt words in all three conditions. A total of 60 words, i.e., antonym pairs, were learnt in all three conditions (20 words for each condition). It was hypothesized that when subjects learnt words out of context, they had no basis of expecting the word and hence would rely on perceptual or visual information of that stimuli. This reliance would be reflected on implicit memory in terms of an improved performance on perceptual identification test but not on recognition memory test. In contrast, when subjects generated words, they not only developed expectations about the words but also meaningfully used the contexts of the given words. This would lead to a conceptual-driven processing and would reflect on explicit memory in terms of an improved performance on recognition memory. Finally, when words were read in a meaningful context, intermediate use of data-and conceptual-driven processing would take place.

A total of 80 under-graduate psychology students of McMaster University were selected in all three experiments. A within-subject ANOVA revealed that indeed, the mean probability of
perceptual identification of words read out of context was higher (0.70) than those of words read in context (0.63) which was again higher than those of words that were generated by subjects during learning (0.52). Exactly opposite results (i.e., dissociation) were found on recognition memory performance. Out of context words were least probable to be recognized (0.443) than those of in-context words (0.70) and generated words (0.76). Hence, it was found that normal subjects also performed differently in explicit and implicit tests of memory which depended on conceptual-driven and data-driven processing respectively.

More recently, similar dissociation between explicit and implicit memory have been demonstrated by researchers in the domain of marketing. The underlying factors influencing these two forms of memory and that explaining the nature of the dissociation have remained the same, however.

One such study by Holden and Vanhuele (1999) examined the impact of implicit memory conceptualized in form of brand familiarity on consumer choice decisions and compared this impact with that of explicit memory conceptualized in form of memory of exposure context. An experiment was conducted which comprised of two sessions. In the first session (exposure), subjects heard names of 40 fictitious pharmaceutical brands under either deliberate or incidental attention conditions. Subjects were explicitly told that all the brands were fictitious in nature. In session two, half of the subjects heard names of 120 pharmaceutical brands out of which 60 names represented existing brands, 20 names were for new fictitious brands while the remaining 40 names represented old fictitious brands. The other half of subjects saw all these 120 brand names instead of hearing them. For each brand name that the subjects either heard or saw, they were required to identify them as either known, recognized, or unknown. It was conceptualized that the judgmental response for old, fictitious brands as known (i.e., real) was based on brand
familiarity (which reflected implicit memory) coupled with a failure to remember the context of exposure (which reflected explicit memory). It was hypothesized that deliberate or incidental attention to fictitious brand names would increase their likelihood of later being judged as known or existing (i.e., real). On the other hand, it was hypothesized that deliberate attention to fictitious brand names in the first session would lead to higher levels of recognition (i.e., remembering the exposure context) as compared to incidental attention. Finally, the authors hypothesized that a match in sensory modality (hear vs. hear) between session one and two would increase the misidentification of fictitious brand as known as compared to a mismatch (hear vs. see). However, this match would not impact explicit memory and recognition rate. Hence, a 2 (attention: divided vs. incidental) x 2 (sensory modality: match vs. mismatch) x 3 (exposure: existing brand vs. old fictitious brand vs. new fictitious brand) mixed design was conducted, where the first two variables were between-subject manipulation at exposure and the last one was a within-subject manipulation during test. As hypothesized, significant main effects of exposure to fictitious brands was found on known response. Also, significant interaction of exposure with attention was found. These results revealed that explicit and implicit memory dissociated in a sense that explicit memory or memory of exposure context might decay while implicit memory or sense of familiarity remained intact.

Similarly, Yoo (2007) conducted a study in which he introduced implicit memory measure as an alternative to assess effectiveness of website advertisements, such as banner ads. It was hypothesized that since website ads often received incidental attention and low processing from consumers, explicit memory measures such as recall and recognition of such ads as well as direct measure such as click-through rate would suffer. However, since implicit memory did not depend on level of processing, it would remain intact even in incidental attention condition.
unlike explicit memory which would decrease as focus of attention and level of processing decreased. It was also anticipated that subjects exposed to web ads, even in incidental attention condition, would help increase their familiarity towards the ads and would lead to more favourable attitude toward the ads than those in the control group. Accordingly, an experiment was conducted with level of ad processing (high vs. low vs. control group) as a between-subject factor. A sample of 140 under-graduate students from a major Mid-Western University was recruited for the study. Recall and recognition of earlier exposed ads formed parts of explicit memory measure while a word-fragment completion test was conducted to measure implicit memory. Data analysis using t-tests and ANOVA revealed dissociations between implicit and explicit memory as level of ad processing impacted explicit memory while implicit memory remained unaffected. It was also found that subjects in low processing group exhibited more favourable attitude toward the ads without significant increase in click-through intention than those in the control group.

2.3.3 How Implicit Memory Works – Transfer Appropriate Processing Framework

The sharp dissociations between implicit and explicit memory reported in the previous section present an opportunity to memory researchers to understand the unconscious nature of implicit memory with greater details. In order to explore the reasons of such dissociations and provide a detailed explanation of how implicit memory works, researchers have used two general approaches. Researchers working in the domain of neuropsychology and neuroscience have relied on the theoretical explanation that there are distinct memory systems, declarative and procedural, within the brain that explain the nature of such dissociations (Roediger, 1990; Schacter, 1989; Squire, 1986, 1987; Weiskrantz, 1989). Although robust in nature, the scope of application of such theoretical explanations by marketing practitioners in order to influence
consumers’ implicit and explicit memory seems to be limited. Alternatively, researchers from the domain of cognitive psychology have proposed a more relevant explanation, the processing approach, to explain the dissociation between implicit and explicit memory (Holden and Vanhuele, 1999; Jacoby, 1983, 1988; Kolers and Roediger, 1984; Roediger and Blaxton, 1987a, 1987b).

The main proposal of the processing approach is that dissociations between explicit and implicit memory tests occur because an explicit memory test requires altogether different cognitive procedure as compared to an implicit memory test (Roediger, 1990, p.1048). A particular memory test\(^{12}\) benefits to the extent there is an overlap between cognitive operations at test with those engaged during stimuli exposure (learning) condition (Roediger, 1990). The concept of overlapping of cognitive operations is more popularly referred as Transfer Appropriate Processing framework. The subsequent section will discuss briefly few empirical findings that have used this framework to explain dissociations and the way implicit memory works.

Morris et al. (1977) were among the first few researchers to propose the transfer appropriate processing framework that explains dissociation between different types of memory. The objective of their study was to inquire the assumptions of level of processing framework (Craik and Lockhart, 1972) which claims that the nature and durability of memory traces is determined by the level of processing\(^{13}\) and that semantic level of processing of stimuli leads to better memory traces than superficial level of processing. In the present study, this claim was

\(^{12}\) It may be either explicit memory test or implicit memory test.

\(^{13}\) In the present study by Morris et al. (1977), level of processing has been categorized into two types – semantic and superficial (non-semantic). In later studies dealing with dissociations between implicit and explicit memory tests, semantic processing has been referred to as conceptual processing while superficial or non-semantic processing has been referred as perceptual processing.
questioned. It was hypothesized that the nature and durability of memory traces did not depend on the level of processing; instead they depended on the extent to which cognitive operations, i.e., nature of processing (semantic or superficial) at test overlapped with those engaged during initial learning or acquisition phase. Three experiments were conducted in the study. In experiment 1, a sample of 32 psychology students of a Mid-Western University were engaged in a 2 (processing during acquisition: semantic vs. superficial) x 2 (congruency: yes vs. no) x 2 (test: standard recognition vs. rhyming recognition)\(^{14}\). The first two factors were within-subject factors manipulated during acquisition, and the last one was a between-subject factor manipulated at test. Most importantly, the memory test adopted varied in terms of target items to be recognized, and hence varied in their overall nature. The standard recognition test was an explicit memory test which asked the subjects to remember original target words. The rhyme recognition test was similar to an implicit memory test because it asked the subjects to recognize rhymes of original target words without any explicit instruction to remember or recall the original target words\(^{15}\). Results revealed that semantic processing was superior to superficial processing when subjects performed the standard recognition test. However, the results reversed when rhyme recognition test was taken by subjects in which superficial processing led to better

\(^{14}\) Semantic processing: Subjects are given list of sentences with one BLANK (______). The blank word is the target word to be remembered and it either has/does not has a conceptual or semantic connection with the sentence. At a pause of 2 seconds, the answer of the BLANK (i.e., target word) is presented vocally. E.g., The __________ have a silver engine – Pause – TRAIN/CAKE.

Superficial processing: Subjects are given list of sentences with one BLANK (______). The blank word is the target word to be remembered and it either has/does not has a perceptual or phonetic (superficial) connection with the sentence. At a pause of 2 seconds, the answer of the BLANK (i.e., target word) is presented vocally. E.g., __________ rhymes with legal – Pause – EAGLE/CHAIR.

Congruence: Subjects respond either “yes” when there is a PHONETIC/RHYME match or a SEMANTIC match between target word and sentence (TRAIN and EAGLE) or respond “no” when there is a mismatch (CAKE and CHAIR).

\(^{15}\) The terms explicit memory and implicit memory have not been used in the study as they are adopted by researchers at later period during early 1990s.
memory traces than those of semantic processing. Further, it was also revealed that despite the significant impact of superficial processing on rhyme recognition scores, the standard recognition scores were low, i.e., dissociation was confirmed. Experiment 2 conducted with a sample of 114 students reconfirmed these results, for both immediate and delayed tests\textsuperscript{16} of memory. Finally, experiment 3 conducted with a sample of 25 students revealed that the effects found were independent of number of times the rhyme sound was presented during acquisition. Hence, while the basic assumptions of level of processing framework were questioned, the transfer appropriate processing framework suggested that even superficial levels of processing had impacts on memory when there was an overlap between mode of processing during learning and mode of processing during retrieval.

A study conducted by Jacoby (1983) that had been reported in the previous section also used the same transfer appropriate processing framework to explain dissociation between explicit and implicit memory. As mentioned earlier (for details, see Section 2.3.2) this study manipulated the subjects’ mode of processing engaged during learning words such that words read out of context underwent perceptual processing while those which were generated from the context underwent conceptual processing. Words which were read in context exhibited a mix of both conceptual and perceptual processing. Four experiments were conducted with a sample of 60 student subjects to examine their explicit and implicit memory by means of recognition and perceptual identification tests respectively. As mentioned earlier, recognition tests of memory required conceptual processing at test and perceptual identification tests required perceptual processing at test. Results from the experiments revealed that the mean probability of perceptual identification of words read out of context was higher (0.70) than those of words read in context (0.63) which was\textsuperscript{16} The delay is for a time period of 24 hours.
again higher than those of words that were generated by subjects during learning (0.52). Exactly opposite results (i.e., dissociation) were found on recognition memory performance. Out of context words were least probable to be recognized (0.443) than those of in-context words (0.70) and generated words (0.76). This meant that a transfer appropriate processing had taken place and subjects had exhibited better memory performance whenever there was any match between mode of processing during learning and testing conditions.

Weldon and Roediger (1987) conducted a study to examine the role of retrieval factors in determining whether words or pictures exhibit superior retention. The main objective of their study was to question the picture superiority effect, i.e., the fact that pictures were remembered better than words. They hypothesized that encoding and retrieval of imagery information (pictures) was a conceptually-driven process while encoding and retrieval of verbal information (words read out of context) was a data-driven process. Hence, they further claimed that existing findings had been able to reveal picture superiority effect because the retrieval tests that had been used were all explicit measures of retention that typically depended on conceptually-driven cognitive processes. Alternatively, they hypothesized, that if any implicit measure of retention were engaged which itself was a data-driven process, the picture superiority effect would reverse, i.e., words would be better remembered than pictures. Accordingly, they conducted an experiment that engaged two types of memory test – a free recall test which measured explicit memory and drew on conceptually-driven processing, and a word-fragment completion test which measured implicit memory and relied on data-driven processing. A sample of 90 undergraduate students from Purdue University was shown a set of pictures and words. After a brief exposure, all the subjects went through the two memory tests as mentioned above. In the free recall test, subjects were asked to recall as many pictures and words as possible they had seen
earlier. The word-fragmentation test asked students to complete word fragments. Some fragments corresponded to prior exposed words, some to the names of prior exposed pictures and others to non-studied items. Data analysis using ANOVA was employed which compared mean proportions of word-fragments completed and words recalled for pictures and words that were exposed earlier to the subjects in study condition. Results from the free recall test revealed that indeed mean proportion of pictures remembered (0.39) was significantly more than those of words (0.29). While these results revealed a picture superiority effect, the results from the word-fragment completion test revealed a reverse picture superiority effect. It was found that significantly more word-fragments were completed for prior exposed words (0.26) than for prior exposed pictures (0.11). These results suggested that appropriate retrieval tests were capable of and should be applied to determine whether pictures or words were better remembered. Most importantly, the results conformed to the principle of transfer appropriate processing by which performance on transfer or memory tests benefit to the extent to which tests recapitulate nature of processing used during learning.

These studies and several others throw light on the underlying causes of dissociation between explicit and implicit memory. They further suggest the cognitive operations and processes through which implicit memory works and the relevance of transfer appropriate processing framework in understanding these processes. While explicit memory for prior exposed stimuli depends on conceptually-driven cognitive operations during encoding and retrieval, implicit memory, on the other hand, depends on perceptually-driven (data- or visual driven) mechanisms. The better the extent of the overlap or recapitulation of these cognitive operations between encoding and testing conditions, the better will be the performance on explicit and implicit memory tests.
In the subsequent section which addresses the importance of implicit memory in marketing research, more empirical evidence about the usage of transfer appropriate processing framework in recent times will be provided.

2.3.4 Role of Implicit Memory in Understanding Advertising Effects

Implicit memory has been proposed as an important concept in advertising research primarily because it has the potential of measuring subtle effects of advertising, brand elements and other marketing stimuli on consumers’ memory. As compared to explicit memory which requires explicit cues and conscious awareness to remember prior exposed brand information, implicit memory works at a more unconscious level and hence is able to capture the subtle effects of marketing information on consumers’ memory which in turn predict their future buying behavior.

Duke and Carlson (1993) proposed implicit memory measures as an alternative measure for advertising effectiveness by incorporating the explicit-implicit memory framework. They undertook a conceptual approach in carefully highlighting the limitations of explicit memory measures like recall and recognition, which the managers had been using for decades, to measure effectiveness of ads. Some of the major limitations of explicit memory measures as documented by the authors were that recall and recognition scores vary widely across situations and tap only the conscious retrieval processes. These measures also fail to explain affective responses of consumers towards the ad and the brand. Alternatively, the authors proposed that prior exposure to marketing stimuli may affect future opinions, attitudes, or choices without explicit recall of prior exposed information. That is, consumers’ purchase decisions could not only be influenced by conscious processes but also by unconscious processes, especially at the time of purchase.
Moreover, it was suggested that implicit memory processes help in understanding consumers’ decision making processes at low level of processing as because implicit memory is driven by perceptual processes and remains unaffected by level of processing unlike explicit memory which is driven by conceptual processes and varies as level of processing varies. Finally, Duke and Carlson proposed potential applications of several implicit memory measures like word fragment/stem completion tests, perceptual identification tests, motor skill tests, etc. in understanding the impact of advertising via hierarchy of effect model, i.e., cognition, affect, behavior. For example, it is proposed that word (brand name) fragment completion test can help managers understand cognitive knowledge structure of consumers.

Duke and Carlson (1994) not only proposed the potential application of implicit memory as an alternative measure of advertising and marketing communication effectiveness, but also applied an implicit memory measure to investigate its ability in consumers’ information processing style during stimulus exposure (i.e., encoding) and judgment (i.e., retrieval). They borrowed the explicit-implicit memory framework from the psychology literature to hypothesize that level of processing of brand information would affect explicit memory of consumers but would leave implicit memory unaffected. Also, it was hypothesized that prior exposed stimuli would impact implicit memory unconsciously and this effect would be reflected in terms of enhanced performance in an unrelated task that did not instruct consumers to remember prior information. Accordingly, a 2 (processing strategy: brand processing vs. non brand processing) x 3 (memory test: recall, recognition, word fragment completion) between-subject design was employed with a sample of 226 under-graduate students of a major South-Western University. All the subjects saw a list of print ads. The brand processing subjects were asked to rate the brand related information of each ad they saw in a 5-point Likert Scale and was expected to engage more
processing effort. In comparison, the non brand processing subjects rated each ad’s surface features on the same Likert Scale. Data analysis was conducted to compare mean scores of explicit memory (recall, recognition) and implicit memory (word fragment completion) measures. Results revealed that brand processors recalled and recognized significantly more brand names than non brand processors. It was also found that brand names seen in print ads had a larger proportion of fragments completed than fragments of brand names not seen. This led the authors to conclude that prior information affected consumers’ implicit memory in an unconscious manner. Finally, the data analysis revealed that implicit memory measure (word fragment completion score) did not vary across processing manipulation conditions. Hence, Duke and Carlson (1994) suggested that implicit measures could be adapted for use in advertising research in conjunction with recall and recognition and might provide additional insight into how brand information were processed.

That implicit memory should be considered by marketers as an alternative to explicit memory measures such as recall and recognition in order to capture memory effects in fuller details had also been suggested by Shapiro and Krishnan (2001). In their study, a comparison between explicit and implicit memory was done as a function of two variables – delay between encoding and retrieval, and attention to stimuli (ad) during encoding. Drawing from previous psychology literature, it was hypothesized that since explicit memory relied on semantic and meaning based information, elaborative encoding and level of processing, performance on explicit memory would depend on the level of attention received by the ad stimuli. Divided attention to stimuli during encoding would negatively affect explicit memory performance. Similarly, delay between encoding and retrieval would also negatively affect explicit memory performance since semantic information was known to decay rapidly. On the other hand, it was hypothesized that since
implicit memory relied on physical or perceptual features of the encoded stimuli, factors like delay and divided attention would have no impact on implicit memory performance. That these dissociations were due to different retrieval processes used by explicit and implicit memory was further empirically validated in the study by two methods – a stochastic independence method and a process dissociation procedure (PDP) method. Hence, a 2 (delay between encoding and retrieval: immediate vs. one week delay) x 2 (attention: divided vs. full) between subject experimental design was employed with a sample size of 369 students from a major Mid-Western University. A recognition memory task and a stimulus-based brand choice task were chosen as tests of explicit and implicit memory respectively. Further, another recognition memory task was conducted to understand stochastic independence between explicit and implicit memory. Also, an inclusion and exclusion task was conducted as part of the PDP framework. Data analysis using ANOVA was done and the mean proportions of correct responses (i.e., target brands chosen) on each of tasks were compared as the function of the manipulated variables – attention and delay. Results revealed that implicit memory was preserved even in conditions of delay and divided attention, whereas explicit memory was affected detrimentally by those conditions. These results were further validated by the stochastic independence method and the PDP method. These findings suggested that implicit memory measures should be incorporated by both academicians and managers to analyze effects of advertising, specifically in situations when consumers’ explicit memory retrieval fails.

More recently, Yoo (2007) conducted a study in which he introduced implicit memory measure as an alternative to assess effectiveness of website advertisements, such as banner ads. It was hypothesized that since website ads often received incidental attention and low processing from consumers, explicit memory measure such as recall and recognition of such ads as well as direct
measure such as click-through rate would suffer. However, since implicit memory did not depend on level of processing, it would remain intact even in incidental attention condition unlike explicit memory which would decrease as focus of attention and level of processing decreased. It was also anticipated that subjects exposed to web ads, even in incidental attention condition, would help increase their familiarity towards the ads and would lead to more favourable attitude toward the ads than those in the control group. Accordingly, an experiment was conducted with level of ad processing (high vs. low vs. control group) as a between-subject factor. A sample of 140 under-graduate students from a major Mid-Western University was recruited for the study. Recall and recognition of earlier exposed ads formed parts of explicit memory measure while a word-fragment completion test was conducted to measure implicit memory. Data analysis using t-tests and ANOVA revealed dissociations between implicit and explicit memory as level of ad processing impacted explicit memory while implicit memory remained unaffected. It was also found that subjects in low processing group exhibited more favourable attitude toward the ads without significant increase in click-through intention than those in the control group.

The findings from these studies and several others propose implicit memory as an important concept to be considered by both managers and academicians dealing with advertising research. Indeed, the limitations of explicit memory, as reported above, has led researchers to consider implicit memory as a supplementary measure to evaluate effectiveness of advertising and other marketing stimuli. Firstly, explicit memory measures can only reveal advertising effects that are accessible to conscious retrieval. However, advertising might also influence unconscious memory processes. Likewise, consumers’ purchase decisions could be influenced not only by conscious processes, but also by unconscious processes, specifically at the time of purchase in
stimulus-based situations. Secondly, measures of implicit memory can detect advertising effects resulting from incidental advertising exposure or when attention is divided between processing the ad stimuli and some other activity. Thus, the relevance of implicit memory in product placement research and in understanding advergame effectiveness is clearly visible. Advergames provide an excellent opportunity to scrutinise whether these cognitive operations underlie game players’ performances in automatic and conscious tests of memory retrieval. Moreover, once the relationship between game outcomes and motivational nature of players are conceptualised, it will be imperative to use the transfer appropriate processing framework to gestate the influence of outcome-induced motivational nature expressed in term of players’ regulatory focus on their explicit and implicit memory of brand elements embedded in the advergame.

2.4 Gaps in Literature

Review of literature was carried in three streams, namely, information processing in advergames, regulatory focus theory, and implicit memory. The following literature gaps were identified:

i. The information processing stream of research in the domain of advergames focuses on issues like limited capacity aspect of attention, processing fluency, and role of arousal and presence in the virtual gaming world. It entirely ignores one of the primary facets of advergames, i.e., game outcomes in terms of winning and losing and the effect of these outcomes on players’ motivation which plays an important role on how consumers process information. Prior studies have not looked into this aspect.

ii. While it has been found in extant psychology literature that different types of message feedback (positively and negatively framed feedback) provided to subjects influence their nature of induced regulatory focus, such relationships have never been tested in the
context of advergames. It may be noted here that advergames provide an excellent opportunity to test the influence of game messages shown to players on their motivational nature. There are several advergames, e.g., Need for Speed: Porsche Unleashed (Porsche), Pizza Hero (Dominos), etc, that show some sort of text messages to the players after they complete playing and end up either winning or losing the game. However, to the best of our knowledge no study has explored the effect of these messages on players’ motivation.

iii. Most studies have investigated the impact of advergames on explicit memory (recall and recognition) built around an assumption that information processing and learning require attention and effort in a cue-driven environment (e.g., product placement). In other words, only cues available to consciousness should impact behaviour. However, this might not always be the case. Prior research indicates that informational cues might also impact consumers’ implicit memory (unconscious). In the context of advergames players’ attention are divided between playing the game (primary task) and processing brand related information (secondary task) which might also activate their implicit memory. However, effect of advergames on players’ implicit memory have hardly been studied in earlier researches and continue to remain as a research limitation.

iv. The influence of different types of regulatory foci (promotion and prevention) on human emotions and task related performance have been empirically validated in the domain of psychology. Marketing scholars have also extended these studies in the context of consumer behavior, TV advertising, and consumer decision making. However, perhaps because of the relative newness of the domain, the effects of induced regulatory foci on consumers’ affective and cognitive reactions such as attitude and emotions have not been
tested in the context of advergames. It might be noted that advergames provide a complex context due to the integration of brand and game related information in a common platform. Hence, the influence of players’ regulatory states and on their attitude toward the advergame and embedded brands, and emotions posit interesting yet unstudied topics which require empirical investigation.

The next chapter covers the proposed conceptual framework and the proposed hypotheses of the research.