Multisensory Packaging Design

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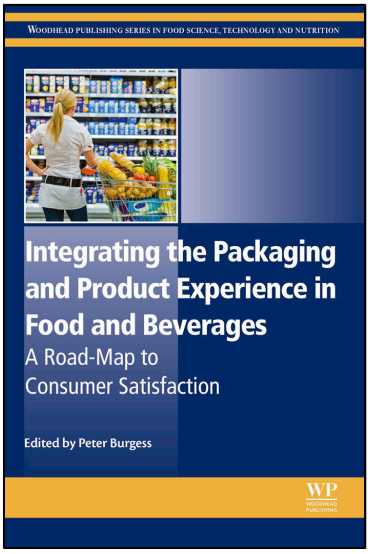

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Multisensory Packaging Design: Color, Shape, Texture, Sound, and Smell

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1.1 Introduction

The multisensory attributes of the packaging undoubtedly constitute a key element in the success of many, if not all, mass market food and beverage products (eg, Klimchuk and Krasovec, 2013; Moskowitz et al., 2009; Paine and Paine, 1992). In recent years, the function of food and beverage packaging has certainly gone far beyond its original role in portion control and product preservation (see Hine, 1995 for a historical overview). In fact, as the decades have passed by, the key role(s) played by the packaging in marketing has become increasingly clear (see Calder, 1983; Day, 1985; Lannon, 1986; Masten, 1988; Pilditch, 1973; Sacharow, 1982; Schlossberg, 1990; Simms and Trott, 2010; Underwood and Ozanne, 1998; Vartan and Rosenfeld, 1987); Nowadays, then, packaging really is the fifth "P" in the marketing mix (eg, Nickels and Jolsen, 1976). Here at the outset, though, it is perhaps worth bearing in mind that the cost of the packaging far exceeds that of the contents in many product categories (see Spence and Piqueras-Fiszman, 2012). No wonder, then, that getting the packaging "right" has become such a key element of the marketing strategy for many companies when it comes to trying to ensure the long-term success of their products in the increasingly competitive marketplace. At the same time, however, many companies are having to deal with a growing consumer and governmental backlash against what is perceived (by many) to be an excess of packaging (eg, see Anon, 2006; Finch and Smithers, 2006; Usborne, 2012).

In this review, I will focus on the multisensory aspects of packaging design for food and beverage products, an area of growing interest in recent years (eg, Anon, 2010b; Day, 1985; Hruby and Sorensen, 1999; Spence and Piqueras-Fiszman, 2012). Food and beverage packaging is a particularly intriguing category because it is one in which the packaging has to serve multiple functions. On the one hand, it obviously needs to stand out on the shelf (just as for other product categories). However, given that it has been estimated that we consume as much as a third of the food products we buy direct from the packaging, which certainly needs to be optimized for the consumption experience as well. In fact, a growing body of both anecdotal and empirical research now shows that changing the multisensory design of the packaging can significantly affect people's judgments of the contents (eg, Mohan, 2013; Raine, 2007). No surprise, then, that over the last few years it has been estimated that a third of the world's largest brands have been working on "sensory branding" strategies (Johnson,

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2007). Indeed, time and again, it would seem that consumers have a hard time when it comes to trying to report solely on the sensory/hedonic properties of products themselves. That is, they are often influenced in their evaluations by the extrinsic (Underwood, 1993) sensory properties of, and meanings attached to, the product packaging (see Spence and Piqueras-Fiszman, 2012). More often than not, what one sees, at least in the setting of the laboratory, is that people's feelings about the packaging tend to carry over and influence what they say about the contents (that is, the product itself) when they come to taste/evaluate them. Such effects have been described in terms of the notion of "sensation transference" (Cheskin, 1957; Spence and Piqueras-Fiszman, 2012) or "affective ventriloquism" (Spence and Gallace, 2011).

The fact that our perception of a product can be so radically affected by the multisensory design of the packaging obviously raises troubling questions concerning the utility of so much blind food and beverage testing, where products are evaluated away from any of their packaging (Davis, 1987). How can one ever hope to predict the ultimate success of a product under such conditions, one might well ask (Spence, 2009)?

The focus in this review will be on the various sensory aspects of the packaging. I want to start by looking at those attributes of the packaging that can be ascertained visually, namely the color, shape, and texture—though, of course, the latter two can also be experienced haptically in the consumer's hands (eg, Piqueras-Fiszman and Spence, 2012a; Spence and Piqueras-Fiszman, 2012). The sound made by the packaging when a product is picked up from off of the shelf, or when it is opened, also constitutes a potentially important, if often overlooked, aspect of the consumer's overall multisensory product experience (see Byron, 2012; Spence and Piqueras-Fiszman, 2012; Spence and Wang, 2015). Finally, there has been a recent growth of interest in scent-enabled packaging; and, as we will see later, some innovative souls are even considering the possible market for edible packaging (just think of the analogy with the skin of the grape; see http://www.wikipearl.com/).

1.2 Neuroscience-Inspired Packaging Design

Part of the recent growth of interest in multisensory packaging design undoubtedly stems from the potential utilization of some of the latest research techniques from the field of experimental psychology and cognitive neuroscience. Increasingly, such methods are being used to help packaging designers discriminate between the different design alternatives that they might be considering. Techniques such as the implicit association test (see Parise and Spence, 2012; Piqueras-Fiszman and Spence, 2011; see also Maison et al., 2004) and eye-tracking (Clement, 2007), especially when combined with other techniques such as word analysis (eg, Piqueras-Fiszman et al., 2013; see also Ares and Deliza, 2010) or the analysis of a consumer's grasping behavior (Juravle et al., 2015; see also Desanghere and Marotta, 2011), would seem especially promising here. That said, not all of the innovative techniques that have been tried in the area of multisensory packaging design have proved successful (eg, see Durgee and O'Connor, 1996).

Another area of rapidly growing research interest relates to the use of online testing platforms such as Mechanical Turk and Prolific Academic (see Woods et al., 2015 for a recent review). These online resources are increasingly enabling researchers to evaluate the relative merits of various different packaging designs in diverse markets at surprisingly low cost (and in a time frame that is likely to keep the marketing manager happy). In our own work in this area, for instance, we have often been able to collect data from more than 300 participants in less than an hour (eg, Velasco et al., 2015b). While the spread in terms of the participant base is still not ideal when it comes to answering many marketing questions, the explosion of online testing resources is definitely one emerging approach to packaging research to watch closely in the coming years.

In recent years, a growing number of research practitioners have become increasingly excited by the possibilities associated with the use of cognitive neuroscience techniques such as functional magnetic resonance imaging and event-related potentials. The suggestion from the neuromarketers is that such research methods can be used to evaluate the design of product packaging more directly, that is, without having to rely on what the consumer says that they are going to do, or which of a range of packaging design alternatives they indicate that they prefer (eg, Basso et al., 2014; Pradeep, 2010; Stoll et al., 2008). My suspicion, though, is that such enthusiasm for the neuromarketing approach is currently misplaced, especially when it comes to the evaluation of multisensory packaging design solutions, that is, solutions that go beyond the merely visual. (And that is before one starts to think about the consequences of countries such as France banning brain-scanning for business (Oullier, 2012).) For, at least in my experience working with industry over the years, the majority of neuroimaging techniques generally tend to be too slow and too expensive to utilize in most real-world commercial situations. (No wonder, then, that so many neuromarketing companies have started to shift more toward online behavioral testing in recent years.) What is also worth bearing in mind here is that researchers interested in packaging design have actually been using electrophysiological brain-imaging techniques for more than three decades now with, it has to be said, remarkably limited success (eg, see Weinstein, 1981 for one early example). And while it may certainly be true that incorporating colorful brain scans into the presentations was, at least for a time, an influential marketing tool in its own right (see McCabe and Castel, 2008; Weisberg et al., 2008), the latest evidence suggests that the seductive allure of such images is probably starting to wane (Michael et al., 2013; Spence, 2015). Hence, for all intents and purposes, I believe that it is the psychological sciences rather than the cognitive neurosciences that may have more to offer the packaging design agency, marketer, or brand manager when it comes to innovating in terms of their design solutions.

All that being said, I am firmly of the belief that one's study designs when it comes to evaluating packaging designs can, and probably should, be inspired by the latest insights emerging from neuroscience, hence the title of this section. And while the neuroscience-inspired approach is unlikely to offer any design solutions in its own right, it can nevertheless help to provide robust methods for discriminating between different (possibly quite similar) design alternatives. Although the transition is undoubtedly a slow, and for some a painful, one, I think we are starting to see the gradual decline

of the once ubiquitous focus group in the field of packaging design (Lunt, 1981), and its replacement by neuroscience-inspired techniques. (No bad thing in my opinion!)

In part, the growing popularity of such alternative testing techniques has been necessitated by the growing realization that perception is inherently multisensory. That is, none of us, psychologists and neuroscientists included, can unpick our senses (see also Pinson, 1986). We all perceive only the integrated output of our senses (see Spence, 2009), thus meaning that none of us are particularly good at determining the actual senses that may actually be responsible when introspecting about our own perception.

In the sections that follow, I will look at each of the sensory elements of product packaging.

1.3 Packaging Color

Let's start by looking at color (Plasschaert, 1995; Salgado-Montejo et al., 2014). Color may well be the single most important sensory feature of product packaging. It should come as little surprise, then, to find that color is used by the majority of food and beverage brands in order to indicate the type/flavor of product that can be found within (Danger, 1987; Gimba, 1998). Indeed, according to an informal store audit conducted some years ago by Garber et al. (2001), more than 90% of brands on the supermarket shelf used packaging color to convey relevant information about the contents. What is clear is that in everything from carbonated beverages to pharmaceuticals, the color of the packaging sets expectations about the properties of the contents (eg, Esterl, 2011; Garber and Hyatt, 2003; Roullet and Droulers, 2005; Lynn, 1981; Wan et al., 2015). It likely also influences the consumer's purchase behavior (Seher et al., 2012). Packaging color can also be used to capture attention (Danger, 1987; Marshall et al., 2006; Sacharow, 1970) at what some have chosen to term the "First Moment of Truth" (Louw and Kimber, 2011)—this is something that is especially important once it is realized that the average shopper may see as many as 1000 different products per minute as they walk down the aisles of the average supermarket (Nancarrow et al., 1998).

One thing that is especially interesting about the use of color in product packaging is that the meaning varies by country and by product category (see Wan et al., 2014). And while different brands may use different color–flavor conventions from their competitors (in order to stand out on the supermarket shelf), this is, generally speaking, a risky strategy to adopt (Piqueras-Fiszman and Spence, 2012d). Furthermore, while the meaning of the hue of packaging color may vary, my suspicion is that the saturation/intensity likely conveys the same message regardless of category and regardless of country. Namely, the more saturated the color of the packaging, the stronger/more intense the taste/flavor of the contents is likely to be. That is, strong, bold colors in product packaging generally signify richer flavors and more intense taste experiences.

Piqueras-Fiszman and Spence (2011) conducted a study of the meaning and impact of packaging color for potato chips (or crisps, as they are called in the United Kingdom). These researchers demonstrated that when cheese-and-onion-flavored crisps were placed in the packaging of ready-salted crisps and given to unsuspecting

participants to try in the laboratory, people sometimes perceived that the crisps tasted of the flavor that was associated with the packaging color, or else identified some other flavor entirely (perhaps a combination of the inherent taste/flavor of the crisp itself together with the flavor expectations set by the packaging). Intriguingly, Piquer-as-Fiszman and Spence were also able to highlight the different flavor meaning of packaging color depending on a consumer's specific brand affiliation. So, for example, in the United Kingdom (not to mention in several other countries), light blue is used to signal "salt and vinegar"-flavored crisps, whereas green is associated with "cheese and onion" flavor. However, the Walkers brand has used the opposite color–flavor convention to everyone else in the marketplace since 1983. Somehow, perhaps due to their playful marketing strategy/image, Walkers has managed to succeed with this unconventional strategy for more than three decades now. Under such conditions, the meaning of the color of participants' flavor perception was shown to depend on their brand affiliations.

It is interesting to note that the impact of packaging color on product perception has also been seen in the beverage category (eg, Barnett and Spence, submitted; Cheskin, 1957; Esterl, 2011). In fact, it was Louis Cheskin who first reported that consumers rated 7-Up as tasting more lemony/limy when drinking from a can that was yellower than normal. Meanwhile, more recently, Esterl noted that many North American consumers had been complaining about the change in the taste of their Coke when a limited edition white-colored Christmas can was released.

While marketers often try to establish universal or at least culture-specific meanings, it is important to note that the meaning of color in the food and beverage category is often determined by the particular product category (or image mold) in which that color happens to be presented. Just think, for example, of the meaning of the color red: This color conventionally signifies "ready-salted" when it comes to crisps. However, one and the same color could well mean "no fat" when it comes to the milk aisle. As such, I worry that many of those marketing studies that have attempted to establish the context-independent meanings attached to colors by those in different cultures may be of limited value (eg, Jacobs et al., 1991; Madden et al., 2000; Tutssel, 2001; Wheatley, 1973). To my mind, color is nearly always seen in context.

Of course, given the increasingly global nature of the marketplace for food and beverage brands, one question of growing interest to many brand owners concerns how to choose a color for one's packaging that will have the appropriate meaning in different markets around the world (see also Lowenthal, 1981). To this end, we have recently conducted a series of cross-cultural studies utilizing the power of online testing (see above) in order to determine the putatively appropriate packaging colors for a range of novel flavors of crisps (Velasco et al., 2014b; Wan et al., 2014). For instance, the participants in one study were invited to view a number of packets advertising different flavors of crisps. The participants had to pick the most appropriate color for each flavor from a preselected palate of seven alternatives (yellow, blue, orange, fuchsia, red, green, and burgundy). The results highlighted some degree of cross-cultural consistency: So, for example, the Chinese, Colombian, and British participants whom we tested all picked green as the most appropriate color for cucumber-flavored crisps. When it came to certain other flavors, however, a number of clear cross-cultural

differences in flavor–color associations were apparent. The suggestion here was that the color–flavor associations that were, in some sense, arbitrary were more likely to show cross-cultural associations.

Sometimes, of course, the color that is used for product packaging indicates not the flavor of the product itself (at least not directly) but rather represents a distinctive color associated with a specific brand. Think Coca-Cola's red, Cadbury's Dairy Milk purple, Barilla pasta's blue, or Heinz Baked Beans's bluey-green as representative examples. Given the growing popularity of open windows in product packaging, it can be argued that, looking forward, the most successful brand colors are likely going to be those that provide a good (ie, visually appealing) color contrast when the product is seen through the transparent window against the branded color of the packaging. Excellent examples here are the red of the baked beans against the Heinz brand color, the purple/brown combination of Cadbury's Dairy Milk, and the yellow of pasta against the brilliant dark blue of Barilla. (I have also seen a number of less successful examples over the years. I am not sure how many of them are still in the marketplace. Not many would be my guess.) Given the importance of color to many brands, changing that brand color is then a move to be undertaken only after careful consideration (see Anon, 2013; Cooper, 1996; Esterl, 2011).

1.4 Packaging Shape

According to some prominent marketers (eg, Lindstrom, 2005), the shape of packaging falls squarely under the heading of tactile branding. I would be tempted, however, to argue that such a view fundamentally misses the point that we nearly always look at product packaging before we pick it up (see Juravle et al., 2015). Moreover, given that we are visually dominant creatures, the seen shape of the packaging is likely to have a much greater impact on the expectations and hence on the subsequent experience of consumers than the felt shape of the packaging in their hands. Not that the feel of the packaging isn't important; It most certainly is! It is just that we normally see the color and shape of the packaging long before we feel it, and hence those visual cues anchor and dominate the subsequent experience (Piqueras-Fiszman and Spence, 2015). For those wanting to enhance the feel of their packaging, then, it is better to concentrate on its texture and/or weight (see below).

In recent years, there has undoubtedly been a great deal of innovation in terms of packaging shape (eg, Bertrand, 2002; Miller, 1994; Prone, 1993; Schlossberg, 1990). Here, though, it is important to consider the powerful notion of the "image mold" (Meyers, 1981): This is the name given to a particular packaging shape that has come to be associated in the mind of the consumer with a specific class of product, or on occasion its brand. One of the classic examples is the Wishbone salad dressing bottle. In theory at least, salad dressing could come in bottles of virtually any shape. Yet, due to the success of the Wishbone brand, this has now become the standard shape for bottles of salad dressing in the marketplace. It has, in other words, taken on the status of an image mold. One can think also of the cylindrical container as the image mold for premium ice cream (Cheskin, 1957). Even if shown nothing more than the

Figure 1.1 Silhouette of the Wishbone salad dressing bottle. This image mold conveys the notion of salad dressing in the mind of the majority of North Americans.

silhouette (see Fig. 1.1), many North American consumers are still remarkably good at identifying the product category.

Other examples of branded image molds include the Kikkoman dispenser bottle (Blythe, 2001, p. 116; Day, 1985), the Perrier water bottle, the Brahma beer bottle from Brazil, etc. (Hine, 1995; Johnson, 2007; Miller, 1994). The most powerful of all image molds, though, has to be the branded Coca-Cola contour bottle, first introduced nearly a century ago (Prince, 1994). It is interesting to note here how even as the packaging format has changed over the years, companies like Coca-Cola (and for that matter Heinz when purveying sachets of tomato ketchup) have often chosen to place a black silhouette of the classic image mold of their signature packaging on the side of their new packaging format (Durgee, 2003; see also Arboleda and Arce-Lopera, 2015). I am often struck in my discussions with industry by how many strong national, and on occasion international, brands have no image mold to speak of. I would argue that one cannot underestimate just how much of an impact serving the same food or beverage product in a different packaging format can have on the consumer's multisensory product experience (eg, see Bititsios, 2012).

Now, there is growing interest from marketers and packaging designers wishing to reposition their product by "borrowing" the image mold from an already established product in another category. By so doing, the hope is that they can acquire any positive associations that image mold may hold in the minds of their target consumers (see also Associated Press, 2013). One especially successful example from the UK marketplace in recent years has been the packaging of soup by the Covent Garden Food Co. in the Tetra Pak format (ie, rather than in cans; think Campbell's; Stern, 1981; see Fig. 1.2). Note that this packaging format was formerly associated with milk in the United Kingdom

Figure 1.2 The New Covent Garden Co.'s Tetra Pak carton successfully captures the notion of freshness and conveys the naturalness of its ingredients successfully.
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(Meyers, 1981), hence it had associations with naturalness and freshness. Other players in this space currently include those packaging their high-end olive oil in what look like oversized perfume bottles. Here, though, while the association with an expensive product is certainly achieved, I do worry that the perfume bottle has strong negative associations with liquids that should most definitely not be ingested. Not exactly what one wants with a premium olive oil is my guess.

For those who do not wish to utilize a preexisting image mold for their food or beverage product, then what shape of packaging should they use (or introduce)? Here the neuroscience-inspired approach provides some insights based on the emerging literature on crossmodal correspondences. Crossmodal correspondences have been defined as the surprising cross-sensory associations that many of us share between seemingly unrelated dimensions of experience in different sensory modalities. Crossmodal correspondences have recently been established between tastes, flavors, aromas, and curvilinearity of form. In terms of assessing the shape properties that might correspond with the taste/flavor of a particular product, neuroscience-inspired methods could certainly help. So, for instance, Velasco et al. (2014a) conducted a study in which they assessed which packaging format was best associated with a hypothetical sweet- or sour-tasting product (see also Overbeeke and Peters, 1991; Smets and Overbeeke, 1995). Here, of course, one can think about not only the roundness vs angularity of the packaging itself, but also the roundness/angularity of the label/logo (Ngo et al., 2012; Westerman et al., 2013) or even the typeface (Velasco et al., 2015a). Becker et al. (2011) have shown that the curvature of the packaging affects the consumer's ratings of the taste of a yogurt, while Ares and Deliza (2010) reported that people associate rounder yogurt containers with creamier contents.

Ultimately, then, when thinking about packaging shape, there are two opposing constraints on packaging design: On the one hand, there is the powerful notion of the "image mold"; on the other, there are likely underlying crossmodal correspondences between the taste/flavor of the product and the shape of the packaging/logo (eg, Spence, 2011, 2012; Spinney, 2013; Velasco et al., 2014a). In some cases, of course, the marketers/packaging designers will intuitively have stumbled on the underlying correspondence (see Dichter, 1971), and over time that may have become incorporated into the image mold or convention for the category (see Spence, 2012).

1.5 Packaging Texture

I would say that the texture of product packaging constitutes an important, if relatively underexplored, component of the consumer's overall multisensory product experience (see Anon, 1999; Gallace and Spence, 2014; Spence and Gallace, 2011; Zampini et al., 2006). To date, the impact of variations in packaging texture has primarily been studied in the laboratory setting and in focus groups (Anon, 1999). Packaging designers may have one of a number of objectives in mind when it comes to thinking about changing the texture, or feel, of the packaging. Here, it is worth noting that the packaging designers may wish to convey a notion of a "natural" feel (eg, Labbe et al., 2013; Nikolaidou, 2011) or else to convey a certain affective response in the mind of the consumer who is handling the packaging (Chen et al., 2009; Schifferstein et al., 2013) by the feel of the packaging.

One question that researchers have only recently started to address is whether the feel of the product packaging can influence the consumer's experience of those products that are consumed direct from the packaging. Piqueras-Fiszman and Spence (2012a) addressed this question in a study in which participants were either presented with yogurt or else with pieces of digestive biscuit served in plastic yogurt pots that either had their normal smooth sides or else had been treated to give them a much rougher feel (by adhering a sheet of rough sandpaper to the outside of the packaging). The participants had to rate the texture of the food and their liking of it. The results showed that people's rating of the texture of the digestive biscuit, if not of the yogurt, was significantly affected by the feel of the packaging (rough vs smooth). Now, while no one is seriously thinking about coating their product packaging with sandpaper (as done by Piqueras-Fiszman and Spence, 2012a as just a proof-of-principle study to highlight the potential impact of the feel of the packaging on people's perception of the contents), I have come across one vodka manufacturer who wanted to indicate the strength of the alcohol by the roughness of the sandpaper on which the label was printed (see Spence and Piqueras-Fiszman, 2012)!

In a conceptually similar study, Krishna and Morrin (2008) have shown that if the feel of the container in which a drink is presented is too flimsy, it can also negatively influence how consumers rate the contents (see also Becker et al., 2011; Biggs et al., submitted; Tu et al., 2015).

Giving one's product packaging an interesting feel, or finish, may also constitute an effective marketing tool in that it may encourage the consumer to pick the product up

off the shelf, and by so doing, increase the likelihood that they will end up placing the product in their basket (see Gallace and Spence, 2014; Spence and Gallace, 2011). Here, one might think of everything from the Heineken can that had been coated with tactile paint (Anon, 2010a), through to those bottles and cans with a raised crest or logo on the front-facing side. An interesting, and often distinctive, tactile/haptic feature, one that encourages the consumer to touch and/or pick-up the product, will if anything increase the likelihood of purchase. Of course, such unusual packaging features always have a cost implication attached. Unfortunately, too often it is the case that these features end up being removed from the packaging to save money. In my opinion, this is often a mistake.

1.6 Packaging Weight

One aspect of the feel of the packaging that is absolutely crucial to modulating the consumer product experience is its weight (see Piqueras-Fiszman and Spence, 2012b). Over the last few years, we have conducted a number of studies demonstrating that the consumer's perception of the sensory and hedonic properties of a range of food and beverage products can be altered significantly simply by changing the weight of the packaging in which that product happens to be presented. Generally speaking, those products that are presented in heavier packaging will be generally rated as having a more intense smell (Gatti et al., 2014), as likely to be more satiating (Piqueras-Fiszman and Spence, 2012c; Spence and Piqueras-Fiszman, 2011), and to be of better quality (Kampfer et al., submitted). It is interesting here to note that across a relatively diverse range of product categories, including everything from bottles of wine to lipstick, a strong correlation exists between the weight of the packaging and the price of the product. That being said, there are undoubtedly challenges here, especially given that, as noted earlier, many companies are increasingly being forced to reduce the weight/amount of their packaging. Nevertheless, when one sees the beneficial effects of increased packaging weight on the consumer's multisensory product experience, then the trade-off becomes all the more salient.

Intriguingly, some packaging designers are currently considering whether there are any psychological tricks that can be used to increase the perceived weight without actually adding any more weight to the packaging. Here, one might think of the fact that certain colors appear heavier than others (Alexander and Shansky, 1976). There may also be opportunities here around changing the affordance points for the grasping of packaging (see Spence and Piqueras-Fiszman, 2011).

1.7 Ease of Opening

Now, before closing this section on the haptic aspects of packaging design, it is probably worth pausing for a moment to think about how easy it is to pick up the packaging and to open and/or pour from it. While classic early research suggested that harder-to-open packaging was associated in the mind of the consumer with a higher quality product (McDaniel and Baker, 1977), the number of injuries annually that are attributable to packaging that

consumers simply find too difficult to open should certainly give the packaging designer cause for concern (eg, Whyte, 2013). Here, in terms of differences in ease of opening, one could also contrast a bottle of beer with a twist-off cap versus one that requires a bottle opener (Stuckey, 2012, p. 296). The suggestion being that the difference in effort might well impact the consumer experience, whether the consumer realizes it or not.

Another aspect of ease of opening concerns the number of layers of packaging that the consumer has to work their way through in order to reach the product. There is certainly a role here for adding extra layers of packaging in order to recreate the impression of giving a present. This includes everything from the bottle of wine that comes in a presentation box/case, through to the many layers of packaging that one would traditionally find when trying to get to taste the chocolate in one's Easter egg (eg, Barthel, 1989; see also Rigby, 2010/2011).

Here, one other important issue relates to handedness: When designing asymmetrical packaging it is worth pausing to consider just how easy the average (right-handed) consumer will find it to pick up and use (eg, pour). The important point to note here is that those products that come in packages that afford grasping (and pouring) by the right-hander are likely to be at something of a competitive advantage in the marketplace relative to other products that are sold in packages that are a little more difficult to manipulate (eg, which are in some sense designed for the left-hander; see Fig. 1.3; see also Elder and Krishna, 2012). Another benefit of ease of use is, of course, the potential for increased product usage. Just take, for example, the EZ Squirt plastic ketchup bottle. This innovative packaging design (and the associated increased ease of use) apparently increased consumption by a not inconsiderable 12% (Gladwell, 2009).

Figure 1.3 Two pourable packages. One (on the right) is easier for the right-hander, the other (on the left) is better designed for the left-handed consumer. Note, though, that 90% of consumers are right-handed.

1.8 Auditory Packaging Design

While rarely given the consideration it most certainly deserves, any sounds made by the packaging when a product is picked up off the shelf, or when opened by the consumer, can play an important role in the consumer's overall multisensory product experience. Auditory cues can, for instance, be used to capture the attention of the shopper or consumer (a little too effectively in the case of the ill-fated biodegradable packaging of Sun Chips, which came in at around 100 dB when gently agitated in the shopper's hands; see Horovitz, 2010; Vranica, 2010a,b). The sounds of opening (eg, of a beverage container; Spence and Wang, 2015), or of use (think only of the sound of the aerosol spray; see Spence and Zampini, 2007) can be used to create a signature sound, one that is different from those of the opposition (such as so successfully done by the Snapple "pop"; see Byron, 2012). The sound of the product/packaging can also be designed to provide a functional benefit in terms of the consumer's overall product experience.

Thinking back to Pavlov's dogs, the distinctive sound of opening of a container can presumably also be used to set expectations in the mind of the consumer (Spence et al., 2011). Who knows, such sounds might even be capable of inducing salivation. Relevant here, a few years back, we were able to demonstrate that consumers rated potato chips as about 5% more crunchy if eaten while listening to the noisy sound of a rattling packet of crisps (Spence et al., 2011). Ideally, I would argue that packaging designers should be looking to create those packaging sounds that are both functional and distinctive (Spence, 2014). And when one considers how much money is spent on the visual aspects of branding, it is striking how so many product packages sound indistinguishable on opening (Spence and Wang, 2015); a lost marketing opportunity if ever there was one (see Byron, 2012; Spence, 2014).

1.9 Olfactory Packaging Design

Olfactory packaging design is also an intriguing area within multisensory packaging research (eg, Anon, 2010a,b; Ellison and White, 2000; Neff, 2000; Trivedi, 2006), with a growing number of companies now thinking about how best to incorporate olfactory/aroma cues into their packaging (Spence, 2015). For a number of companies, it may involve impregnating the glue with a scent-encapsulated component, so that when the consumer opens the packaging, they are hit by an aroma (from the packaging) that they will hopefully attribute to the great smell of the food or beverage product inside (see Anon, 2010a,b; Bouckley, 2013; Morran, 2013). Such an approach can be particularly beneficial for those frozen products (eg, imagine a chocolate-covered ice cream) where the low temperature suppresses any release of fragrance from the product itself (see Spence and Piqueras-Fiszman, 2012). A number of the sports waters manufacturers have already been exploring the possibility of scenting the drinking cap/spout.

One has to see it as a lost opportunity that the packaging of chocolate and tea rarely lets the consumer get a whiff of the contents prior to purchase. Here, it is interesting to contrast how effectively the coffee companies play with the scent of their product by means of incorporation of scent valves in the front of their packs. P&G, among others, has realized just how important the scent of the packaging can be to enhancing the likelihood of purchase.

1.10 Tasty Packaging

There is certainly interest in the design of edible packaging WikiPearls as one solution for yogurts, ice cream, etc. (http://www.wikipearl.com/). There is, though, always going to be a concern that consumers do not wish to eat the packaging that may have been in who knows whose hands. Previously, there have conversely been examples where the taint introduced by the packaging has become an integral part of the taste/flavor experience for the consumer, as was once apparently the case for tinned tomatoes (see Rosenbaum, 1979).

1.11 Individual/Cultural Differences in Multisensory Packaging Design

Thus far in this review, the assumption has been that all of one's potential consumers can be treated as a homogenous group. However, as the marketer knows only too well, there are important individual differences in terms of the customer base for different products. Some innovative marketers who are aware of, say, the differences in preferences between males and females, have been able to positively influence sales simply by tailoring their packaging designs to the preferences of the gender of those making the relevant purchasing decision (eg, see Cheskin, 1957). Perhaps even more important than any gender differences, though, are any cross-cultural differences in the meaning of multisensory packaging cues. While to date the focus for the limited research in this area has very much been on cultural differences in the meaning of color in packaging, one could certainly wonder whether relevant cross-cultural differences might also exist when it comes to the meaning, or influence, of product shape and/or texture (see Bremner et al., 2013 for intriguing preliminary evidence in this regard). (With regard to coloring, see Velasco et al., 2014b; Wan et al., 2014 for a couple of representative examples, and http://www.doehler.com/en/lp/multi-sensory-design-for-colours.html?utm_campaign=multi-sensory-design-for-colours&utm_medium=text-ad&utm_source=beveragedaily_website for a recent commercial example—it has for example been suggested that Cadbury's failure to break into the Japanese market could at least in part be traced back to the fact that the signature purple color of their Dairy Milk bar is associated with mourning in that part of the world.) It is also important to bear in mind here any age-related changes in the meaning and appeal of packaging color (eg, see Gollety and Guichard, 2011). Once again, this promises to be a rich area for future research.

1.12 Conclusions

The visual attributes of the packaging are perhaps the single most important sensory cue determining the success or failure of a product on the supermarket shelf. Among the various visual cues that are discernible by the consumer, color is probably the single most important attribute; it is certainly the most thoroughly studied. That said, the last few years have seen growing interest in the opportunities associated with the introduction of innovatively (or just differently) shaped packaging, a distinctive texture or finish, and/or the introduction of olfactory packaging. While the shape and feel of the packaging can be appreciated by consumer hands, as I have argued here, these features are likely to influence the consumer primarily on a visual basis. When it comes to touch and haptics, weight is perhaps the most dominant attribute (and one which cannot readily, or at least reliably, be discerned visually). Given that heavier packaging will normally equate to increased transportation costs, it remains an open question as to whether the benefits in terms of the consumer's enhanced multisensory product experience outweighs the increased shipping costs. In the case of wine, the answer would certainly seem to be in the affirmative (even though these wines can end up being shipped half way across the globe; see Piqueras-Fiszman and Spence, 2012b). In fact, in many of the cases where innovations in packaging design are being considered, there are going to be (often not insignificant) cost implications, and thus a complex calculation by the powers that be as to whether that cost is worth it in terms of increased sales/enhanced consumer product experience.

One other important question relates to how long-lasting the effects of packaging are on the consumer's multisensory product experience. Here it is certainly worth bearing in mind that the majority of studies reviewed here have been conducted over the short term. It will therefore be important for future research to look at the long-term effects in this area. Furthermore, as highlighted earlier, it is important to distinguish between the role of the packaging at the first moment of truth (Louw and Kimber, 2011), when the consumer hopefully sees and is possibly inclined to pick up the product from the shelf, and the subsequent occasion when that product is consumed, very often direct from the packaging (see Wansink, 1996).

Moving forward, excitement is starting to grow around the possibility of reinventing packaging from the bottom up based on the crossmodal correspondences that are shared by the majority of one's consumer base, likely tested and evaluated online. One example of this approach was recently outlined by Velasco et al. (2014a). The incorporation of crossmodal correspondences into the design of product packaging is an area that has grown substantially in recent years (see Schifferstein and Howell, 2015) and shows no signs of abating.

There is also growing interest from producers in considering the modification, if not the total redesign, of their product packaging so that it will stand out most effectively for those consumers who are starting to do more of their shopping online (see Spence and Gallace, 2011) or at the virtual supermarket (Moore, 2011). Under such conditions, the product packaging will likely take up a much smaller area of the customer's visual field when seen on the screen than would be the case in the supermarket aisle. This change in shopping behavior means that forward-thinking companies are increasingly

trying to optimize their visual design for the screen as much as for the shelf. Here, figuring out how to bias the consumer's visual search toward the relevant section of the screen obviously becomes much more important (see Knöferle et al., submitted).

It would be remiss of me to end this piece without mentioning the growing interest in packaging that incorporates printed electronics and which is capable of capturing the consumer's attention by beeping, flashing, etc. (see Bouckley, 2014; Reynolds, 2013). There is also growing interest in functional packaging, such as the new packaging whose color actually changes to indicate when the packaging's contents have gone off (Anon 2011).

More generally, there are still important questions concerning how/whether changes in multisensory packaging design will convert into increased willingness to pay by consumers (eg, Rebollar et al., 2012; Velasco et al., 2015b), not to mention growing concern over the life span of packaging, not to mention its transportation and disposal (Lindenberg, 2012).

Finally, it is important to remember here that packaging is still just one element of the total product proposition. That is, there is also branding, labeling, etc., and it is going to be the complex interplay of all these factors that will eventually help explain the long-term success or failure of a product in the marketplace (eg, Deliza and MacFie, 2001; Mueller and Szolnoki, 2010; Nancarrow et al., 1998; Rigaux-Bricmont, 1982; Underwood and Klein, 2002).

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