

Just-in-Time Technology to Encourage Incremental, Dietary Behavior Change

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Abstract

Our multi-disciplinary team is developing mobile computing software that uses “just-in-time” presentation of information to motivate behavior change. Using a participatory design process, preliminary interviews have helped us to establish 10 design goals. We have employed some to create a prototype of a tool that encourages better dietary decision making through *incremental*, just-in-time motivation at the point of purchase.

Problem

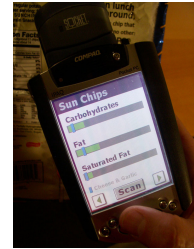
Although the USDA and DHHS periodically release Dietary Guidelines for Americans, only 12% of Americans have “good” eating habits [3]. Many Americans have difficulty applying them in practice. One reason is that common educational strategies (e.g. public service advertising) do not link the dietary message with the behavior at the time and place the behavior needs to be changed. Compelling messages are often overwhelmed by environmental stimuli [2]. Nutritional information is not sufficiently accessible.

Approach

Computing technology makes a new approach possible: deliver highly-tailored messages precisely at the point of decision [1] in response to the needs of the user *at that moment*. We are using a participatory design approach to create such a tool. Our target users are the 74% of Americans whose diet “needs improvement” [3]. We are particularly interested in the majority of this group that is *not* actively engaged in dietary change. The point-of-decision for most food eaten at home is actually the point-of-purchase (or point-of-selection) at the market. Studies assessing the impact of placing information at the point-of-selection in the grocery store have had mixed success motivating behavior change. This may be because these interventions do not respond to the actual decision-making behavior of people. Using exploratory field interviews, we have made the following observations upon which we based the corresponding design goals (DGs):

(1) Users know about large dietary trade-offs, but these are not the decisions they are making. Knowing that eating fruits and vegetables is better than eating foods high in saturated fat does not help a user with the decisions they are actually making, such as “which chips should I buy?” DG: Emphasize just-in-time comparison over absolute information. **(2) People rarely buy food they have not bought before.** DG: Instead of encouraging the user to buy new foods, encourage the user to shift the balance towards healthier foods *within the foods they already eat*. **(3) Users lack an intuitive sense of what common dietary labels mean.** DG: Use analogy to other products the user is familiar with rather than absolute numbers in conveying information. **(4) Users rarely want to be told what they cannot eat.** DG: Avoid using

Prototype tool to motivate just-in-time incremental change by helping users to learn the trade-offs between foods they already eat at a glance. Here a user compares chips and croutons. The comparative information is customized for the user.



technology to present more information about what an expert believes the users should do; keep goals modest. **(5) People can only focus on one narrow aspect of dietary change at a time.** DG: Allow users to select what they care about and easily compare decisions only along that axis in an intuitive way; occasionally present information about other dimensions. **(6) People care about their health and like to learn new things.** DG: Encourage unexpected comparisons relative to known ideas. **(7) Dietary decisions are temporal.** A decision early in the day can impact decisions at a much later time, and people often do not recognize these relationships. DG: Help people see patterns of their behavior and understand the consequences relative to available options. **(8) People get stuck in routines.** DG: Encourage people to plan. **(9) When people want to change, they often do not know how.** DG: Allow users to establish their nutritional goals and provide measures at moments they are needed. **(10) Users tend to categorize their nutritional decisions into “chunks” based on non-nutritional criteria.** For instance, some people track their food intake but not beverage intake. DG: Provide summaries of nutritional behavior.

Prototype

We have created a prototype tool that respects DGs 1-6 that uses a standard PDA with barcode scanner plug-in (see figure). The user interface is simple: scan one item and then another and see a *relative* comparison. However, even this simple tool can be used to deliver tailored, motivational information at points of decision. We believe that for some people use of such a tool would become habitual. At that point, modifications to the software can be created that exploit design observations 6-10. In current work we are developing these ideas and applying the design rules to other domains such as motivating physical activity behavior. This work was funded, in part, by the National Science Foundation.

References

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