On a pathological behavior of conditional states on OML's

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Notation: L will denote an OML with a state m.
L_c will denote the set of all elements $a \in L$ such that $(\exists \bar{m} : L \to [0,1])(\bar{m}(a) = 1)$.

Definition 1 ([3]) *Let $f : L \times L_c \to [0,1]$ be a function fulfilling the following*

- *for each $a \in L_c$ $f(.|a)$ is a state on L;*
- *for each $f(a,a) = 1$;*
- *for mutually orthogonal elements $a_1, a_2, ...a_n \in L_c$ and arbitrary $b \in L$ the following is satisfied*

$$f\left(b \middle| \bigvee_{i=1}^{n} a_i\right) = \sum_{i=1}^{n} f(b|a_i) f\left(a_i \middle| \bigvee_{i=1}^{n} a_i\right).$$

Then f is called a conditional state on L.

Using a canditional state $f : L_c \times L \to [0,1]$ we can define a two-dimensional function $p : L^2 \to [0,1]$ by the formula

$$p(b,a) = \begin{cases} f(b|a)f(a|1), & \text{if } a \in L_c, \\ 0, & \text{if } a \notin L_c. \end{cases}$$

We will discuss propeties of p in case $L_c \subsetneq L \setminus \{\mathbf{0}\}$.

Acknowledgment
This work was supported by the VEGA grant agency, grant No. 1/0279/11.

References

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